IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT Servicer

SET 482 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ APRIL, 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

ALLIANCE TENNA-ROTOR
MODEL T-12

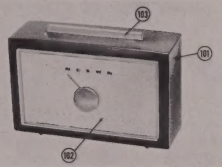
The following information on the Alliance Tenna-Rotor Model T12 is presented through the courtesy of Alliance Manufacturing Co., Alliance, Ohio.

GENERAL INFORMATION

The Alliance Tenna Rotor, Model T-12, is actuated by depressing the right or left end of the bar switch located on top of the control box. Depressing the right end rotates the antenna clockwise. The antenna direction is registered on a direction indicator, located on the front of the control case. The Model T-12 differs from the Model T-10 in that the indicator of the T-12 indicates direction of the antenna at all times and the Model T-10 indicates direction only when control bar is depressed. The Model T-12 control case can be used with the T-10 Rotors manufactured after January, 1954. To use the T-12 control with a DIR or T-10 manufactured before January, 1954, it is necessary to change the potentiometer and contact spring in the rotor with new parts. The new potentiometer needed is part No. 5725-R. The new contact spring needed is part No. 8539-A.

The T12 rotor can be identified by the red weathershield.

The T-12 Tenna Rotors manufactured after June 1, 1958, operate at a speed of one RPM. These may be identified by the date stamp on the rotor and by serial number on the control box. Serial number T1122001 and over are one RPM. Earlier Model T-12 rotors may be converted to one RPM by use of our RCR Kit B.



Control Box—Model T-12.

SERVICE PROCEDURE

Power-off Checks

1. Be sure that four conductor cable is connected to proper terminals. Terminal No. 1 in the rotor should be connected to Terminal No. 1 on the control box and so on with No's 2, 3 and 4.

2. Be sure strands of four conductor cable wire are not shorting between terminals; between terminal and rotor casting or between terminal and control box chassis. Such shorts will cause meter and/or side or front potentiometer and/or calibrating resistor to burn up.

3. Hollow shaft (Item No. 6) must have "play".

4. Primary input contacts (Item No. 111) within the control box should make solid contact for left or right positions and should have approximately 1/16 inch clearance in open position.

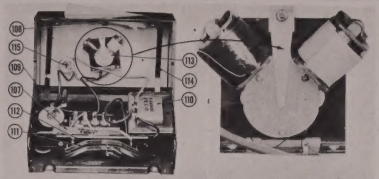
Power-on Checks

1. Line voltage should be approximately 115 volts.

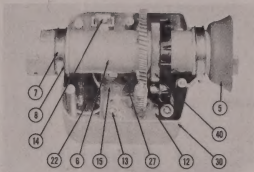
2. Run unit to counter clockwise stop by depressing left end of the control bar (Item No. 103). Indicator pointer should decrease steadily, stopping at left side of the dial when rotor reaches the counterclockwise stop.

3. Adjust calibrating resistor (Item No. 109) for full scale north reading when unit is at full counter clockwise stop.

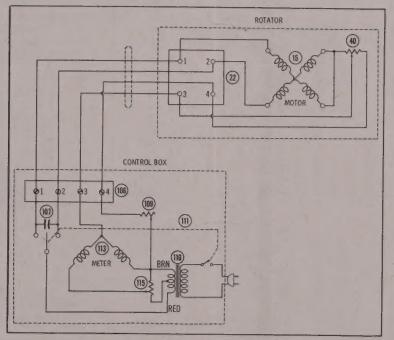
4. Run unit to clockwise stop by depressing right end of control bar. Indicator should increase steadily stopping at the extreme right end of dial when rotator reaches the clockwise stop.



Internal Components Model T-12 Control Box.



Internal Components Model T-12 Rotator Unit.



Schematic Wiring Diagram—Model T-12.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE
Rotor unit fails to operate when control lever is moved for left or right position.	If motor is inoperative: Check control switch contacts. Check internal connections in control box. Check capacitor. Check potentiometer (Item No. 40) in rotor for broken connections or open winding. Check motor.
Rotor operates slowly or sluggishly	Check hook up of four conductor cable. Check size and length of four conductor cable. Change capacitor
Meter fails to indicate properly.	Check Meter. Check side or front potentiometer (Item No. 115) and calibrating resistor (Item No. 109) for dirty, open or burnt windings. * Check contact spring (Item No. 27) for proper contact with potentiometer in rotator. Check spring tension on rear of meter and adjust per instructions. Adjust side or front potentiometer and calibrating resistor per instructions.

* On some units, the potentiometer (Item No. 115) will be mounted on the side of metal chassis.

ADJUSTMENT INSTRUCTIONS

The T-12 Tenna Rotor is shipped from the factory with the side or front potentiometer adjusted and the only adjustment which should be necessary on a new unit is on the calibrating resistor which is located on the back of the control box. However, if it is impossible to get full scale north reading when the unit is at full clockwise stop or when parts have been replaced in the control box, adjust control box in the following manner:

Run rotator to full clockwise stop.

Turn calibrating resistor to clockwise stop.

Remove chassis from case.

Adjust side or front potentiometer so pointer indicates N on right side of scale. DO NOT GO PAST N. Contacts must be held closed on right side with some non metallic object while this adjustment is made.

Replace chassis in case.

Run rotator to full counter clockwise stop and adjust calibrating resistor for N indication on left side of dial.

If preceding adjustments are made on service bench, use 125 feet of No. 20 four conductor cable between the rotator and control case.

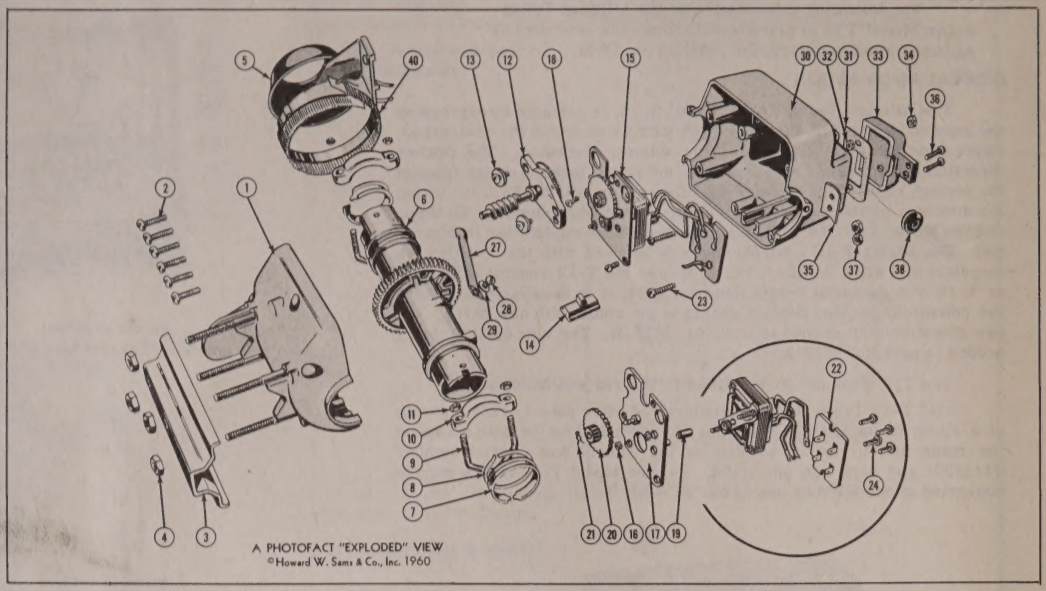
NOTE:

If full range cannot be obtained with the above adjustments, check four conductor cable for recommended length and size.

ADJUSTMENT OF SPRING TENSION ON REAR OF METER.

If pointer sticks, bend banjo slightly to relieve tension on spring until pointer moves smoothly.

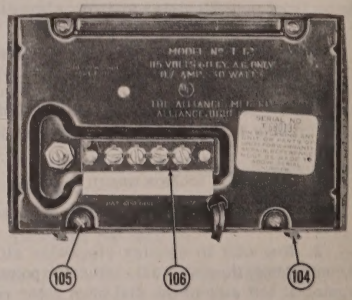
With control box in normal position, tilt 90 degrees clockwise and 90 degrees counter clockwise from normal resting position. If pointer moves, adjust spring tension by bending banjo slightly until no movement is noted when control box is tilted.



ITEM	NAME	PART No.
	Rotator Assembly	Z-5460-R
1	Housing Assembly RH	Y-5454-R
2	Housing Screws	10-32 x 3/4
3	Clamping Plate	X-5456-A
4	Nut, Hex	1/4 x 20
5	Weather Shield	X-3375-B
6	Shaft Assembly	Y-5463-S
6A	Shaft Assembly (1RPM)*	Y-5463-T
7	Bearing Collar	X-3987-A
8	Thrust Washer	X-3376-A
9	U-Bolt	X-3377-A
10	Mast Clamp	X-3319-A
11	Nut, Hex	10-32
12	Worm Assembly	Y-5462-R
12A	Worm Assembly (1RPM)*	Y-5462-S
13	Screw, RH Washer	8-32 x 3/8
14	Stop Slide	X-3320-A
15	Motor & Term. Assembly	Y-5726-R
16	Nut, Hex	6-32
17	Mounting Plate Assembly	X-4263-R
18	Screw, RHM	8-32 x 3/8
19	Spacers	X-4141-A
20	Gear & Pinion Assembly	X-3373-R
21	Retaining Ring	X-4243-H
22	Terminal Plate Assembly	X-5700-R
23	Screw, RHM	8-32-1
24	Screw, Binding Head	6-32 x 5/16
27	Contact Spring	X-8539-A
28	Screw, Self Tapping	6-20 x 1/4
29	Lock Washer	X-2128-A
30	Housing Assembly LH	Z-5326-B
31	Gasket	X-5449-A
32	Nut, Hex	8-32
33	Terminal Cover	Y-5327-A
34	Nut	8-32
35	Strain Relief Clamp	X-3380-A
36	Screw, RHM	6-32 x 1/2
37	Nut, Hex	6-32
38	Grommet	X-3387-B
40	Potentiometer	Y-5725-R

*Used on one RPM Rotors manufactured after June 1, 1958. Serial #T1122001 and over.

	Control Box Complete	Z-5877-R
101	Case	Z-5481-A
102	Window	Y-5485-A
103	Control Bar	X-5484-A
104	Foot Pads	X-5756-A
105	Screw, RHM	6-32 x 1/4
106	Term. Strip Assembly	X-3803-S
107	Capacitor	X-4098-B
108	Pivot Pin	X-5355-A
109	Calibrating Resistor	X-4094-C
110	Transformer	Y-5880-R
111	Switch Assembly	X-5864-S
112	Insulating Strip	X-5351-A
113	Meter & Panel Assembly	Y-5765-R
114	Panel Retainer	X-5495-A
115	Potentiometer	X-8532-B

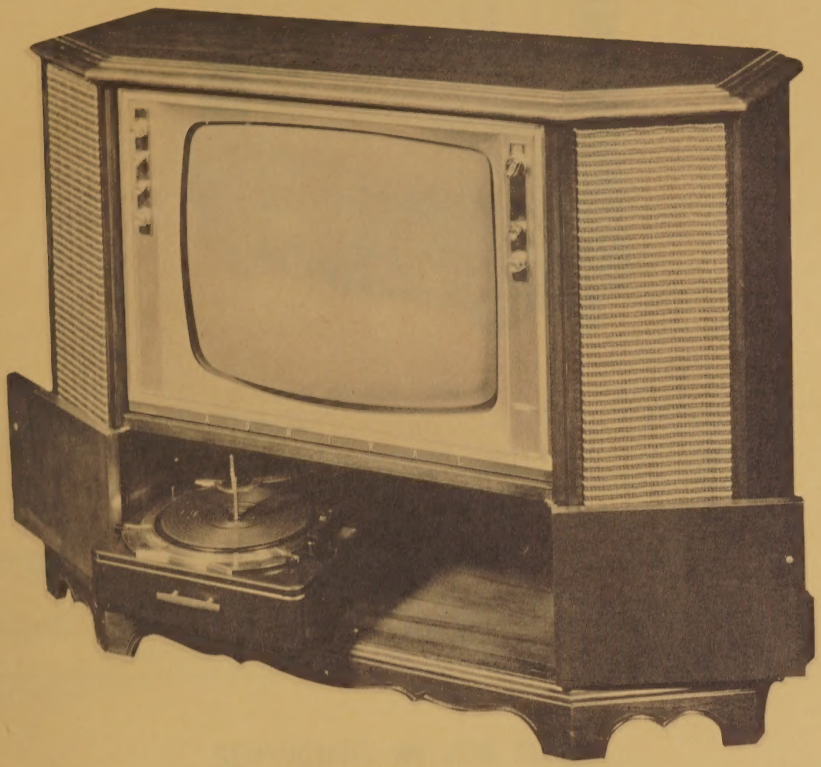


Rear View of Model T-12 Control Box Showing Terminal Strip.

PHOTOFACT® Folder with CIRCUITRACE*

ADMIRAL MODELS ST24M61, 62, 63, 72, 77, STR24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)

ADMIRAL MODELS ST24M61, 62, 63, 72, 77, STR24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)



MODEL ST24M72 (Ch. 20H6, 3S1)

ADMIRAL MODELS ST24M61, 62, 63, 72, 77, STR24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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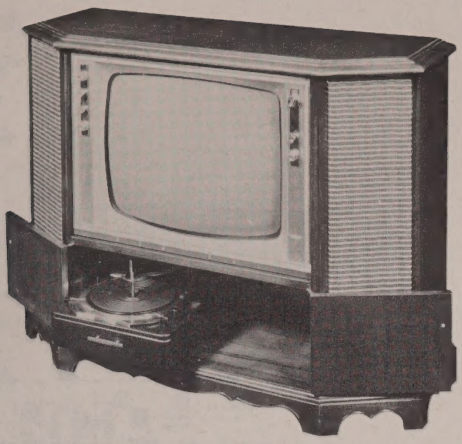
DATE 4-60 SET 482 FOLDER 1

SET 482 FOLDER 1

PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL MODELS ST24M61, 62, 63, 72, 77, STR24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)

ADMIRAL MODELS ST24M61, 62, 63, 72, 77, STR24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)



MODEL ST24M72 (Ch. 20H6, 3S1)

TRADE NAME	Admiral	MODELS	CHASSIS
		ST24M61, ST24M62, ST24M63, ST24M72, ST24M77	20H6
		(With Stereo Amplifier)	3S1
		STR24M81, STR24M82, STR24M83, STR24M92, STR24M97	20J6
		(With Stereo Amplifier)	3S1
		(And FM-AM Tuner)	8W1
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver with Stereo Amplifier and 4 Speed Automatic Record Changer. (STR Series also include FM-AM Tuner)		
TUBES	TV: VHF-Twenty (Includes Stereo Amplifier) FM-AM Tuner: Eight		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING TV: 235 Watts, 2.18 Amp. @ 117 Volts AC		
TUNING RANGE	TV: Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) FM: 88-108MC, IF 10.7MC. AM: 535-1620KC, IF 455KC		

FOR SERVICE INFORMATION ON RECORD CHANGER #RC6E9L-18W, SEE SIMILAR UNIT IN PHOTOFACT SET 398 FOLDER 7.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE

A fuse wire is used for filament protection. (For location, see M2 in photo "Chassis Bottom View".)

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".) Some models may use a 1 Amp. fuse as alternate.

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector knobs.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

Focus may be varied by connecting the lead from the dynamic focus coil to various voltage points. (For location, see "Cabinet-Rear View".)

SYNC STABILITY

Sync stability may be varied by means of a Super-Range Finder Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Lock.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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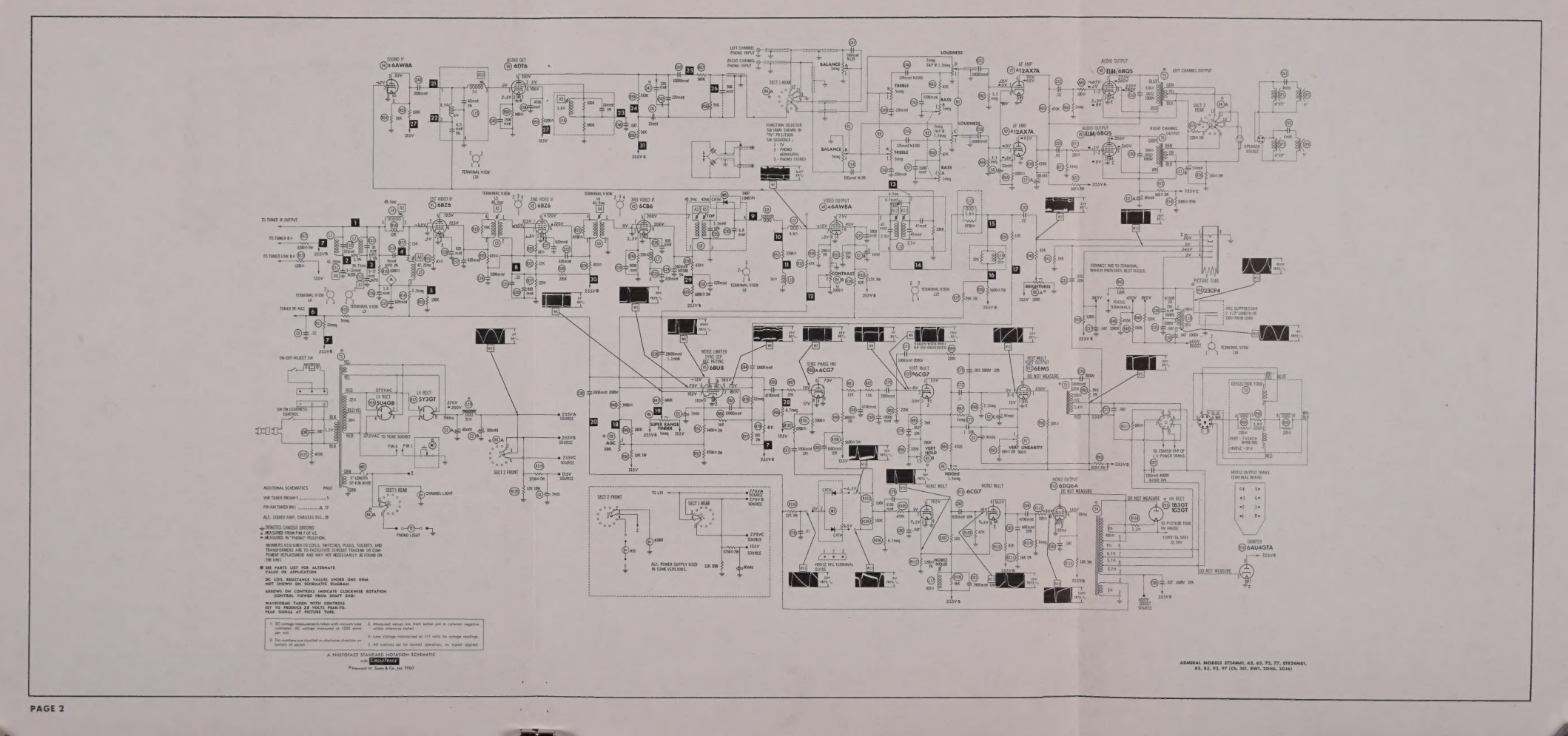
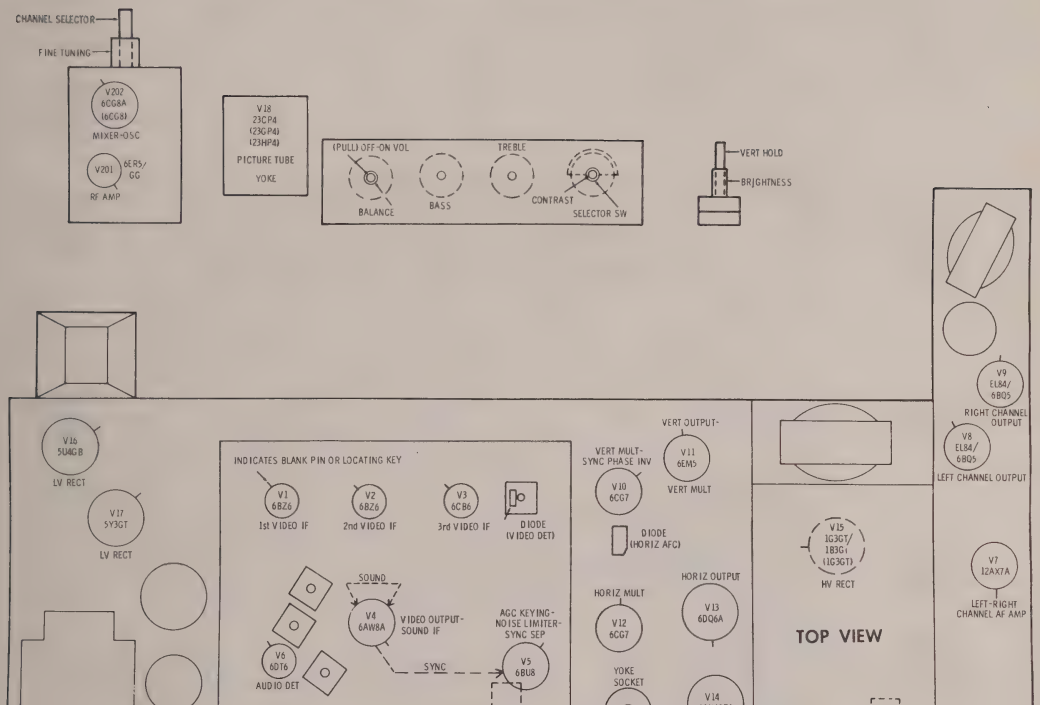
JC787

SET 482 FOLDER 1


SOUND IF
6AW8A
AUDIO DET
6DT6
1ST VIDEO IF
6BZ6
2ND VIDEO IF
6BZ6
3RD VIDEO IF
6CB6
VIDEO OUTPUT
6AW8A
NOISE LIMITER SYNC SEP. AGC KEYING
6BU8
SYNC PHASE INV
6CG7
VERT MULT
6CG7
VERT MULT VERT OUTPUT
6EM5
DO NOT MEASURE
HORIZ MULT
6CG7
HORIZ OUTPUT
6DQ6A
DO NOT MEASURE
HV RECT
1B3GT
1G3GT
AUDIO OUTPUT
6BQ5
AUDIO OUTPUT
6BQ5
1ST IF AMP
12AX7A
2ND IF AMP
12AX7A
AUDIO OUTPUT
EL84/6BQ5
AUDIO OUTPUT
EL84/6BQ5
DAMPER
6AU4GTA
LV RECT
5U4GB
LV RECT
5Y3GT
PICTURE TUBE
23CP4
LEFT CHANNEL PHONO INPUT
RIGHT CHANNEL PHONO INPUT
BALANCE
LOUDNESS
TREBLE
BASS
CONTRAST
BRIGHTNESS
VERT LINEARITY
HORIZ HOLD
VERT HOLD
HEIGHT
SUPER RANGE TUNER
FUNCTION SELECTOR SW (R&A) SHOWN IN "TV" POSITION
SECT 1 REAR
SECT 2 FRONT
SECT 2 REAR
ON-OFF-SELECT SW
SW ON LOUDNESS CONTROL
CHANNEL LIGHT
PHONO LIGHT
SPEAKER SOCKET
TERMINAL VIEW
TO TUNER IF OUTPUT
TO TUNER B+
TO TUNER LOW B+
TUNER IF AGC
275VAC TO YOKE SOCKET
CONNECT R10 TO TERMINAL WHICH PROVIDES BEST FOCUS.
ARC SUPPRESSOR 2 1/2" LENGTH OF 300-OHM TWIN LEAD
TAKEN WITH PROBE OF VTVM GRID TO GROUND
TO CENTER TAP OF I.F. POWER TRANS.
TO PICTURE TUBE HV ANODE
HORIZ OUTPUT TRANS TERMINAL BOARD
DEFLECTION YOKE
HORIZ - 12 Ω
VERT - 2.5 Ω PER WINDING
HORIZ AFC TERMINAL
ALT. POWER SUPPLY USED IN SOME VERSIONS.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER MODEL 5
FM-AM TUNER (RK) ..... A, 17
ALT. STEREO AMP., CHASSIS 351 ..... B
DENOTES CHASSIS GROUND
MEASURED FROM PIN 7 OF V1.
MEASURED IN "PHONO" POSITION.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END.
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 25 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with Circuitrace
© Howard W. Sams & Co., Inc. 1960
ADMIRAL MODELS 5T24M61, 62, 63, 72, 77, 5T25M81, 82, 83, 92, 97 (Ch. 351. BW1, 20H6, 20J6)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

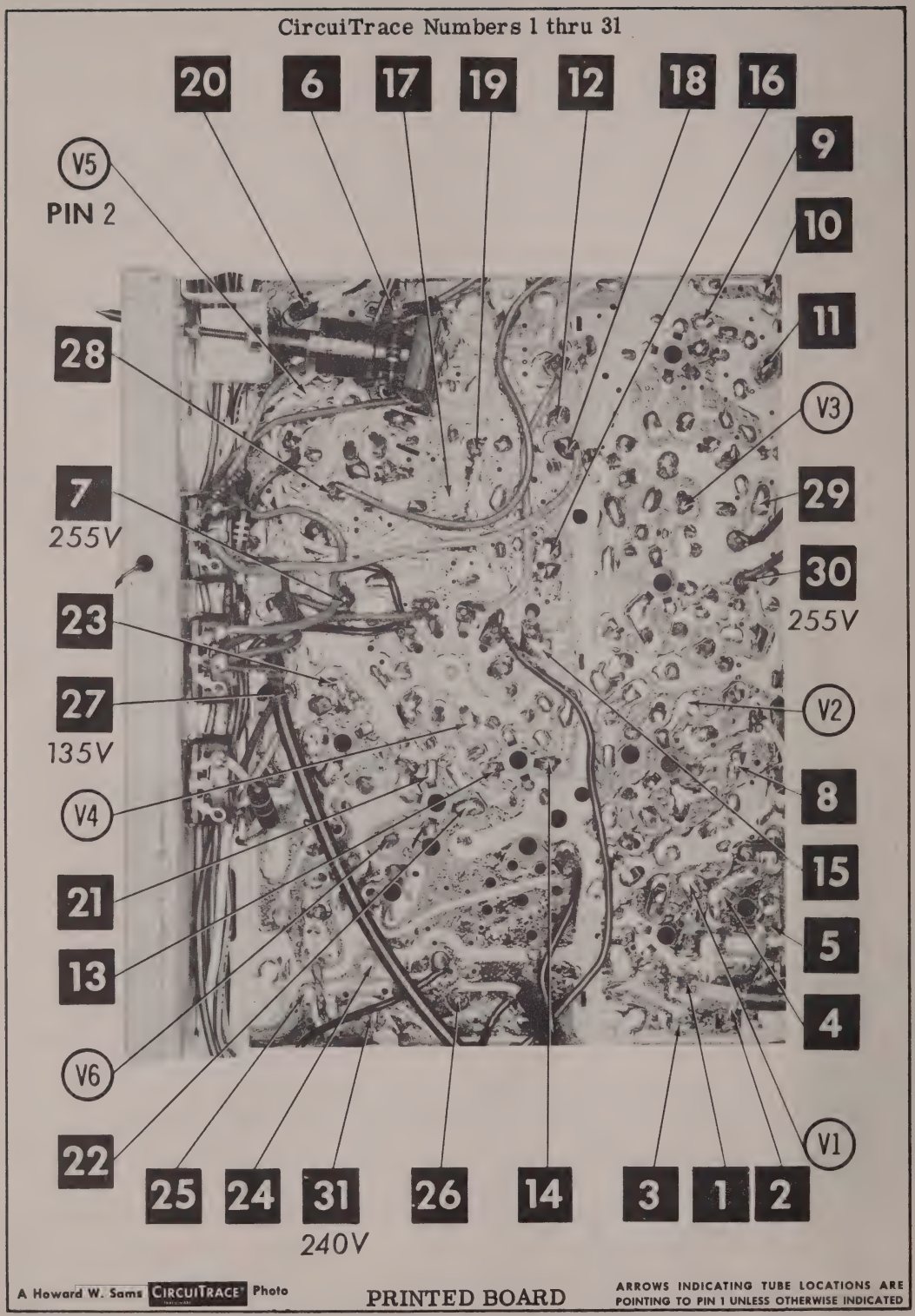
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V16, V17, Fuse Wire (6.3VAC Fil. Winding)

SWEEP FAILURE
No raster, has sound V12, V13, V14, V15, V18
No vertical deflection V10, V11
Poor vert. linearity or foldover V10, V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16, V17
Vert. off freq. V10
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V18
Has pic, no sound V4, V6, V7, V8, V9, (Stereo Amp.)
Overloaded picture V5

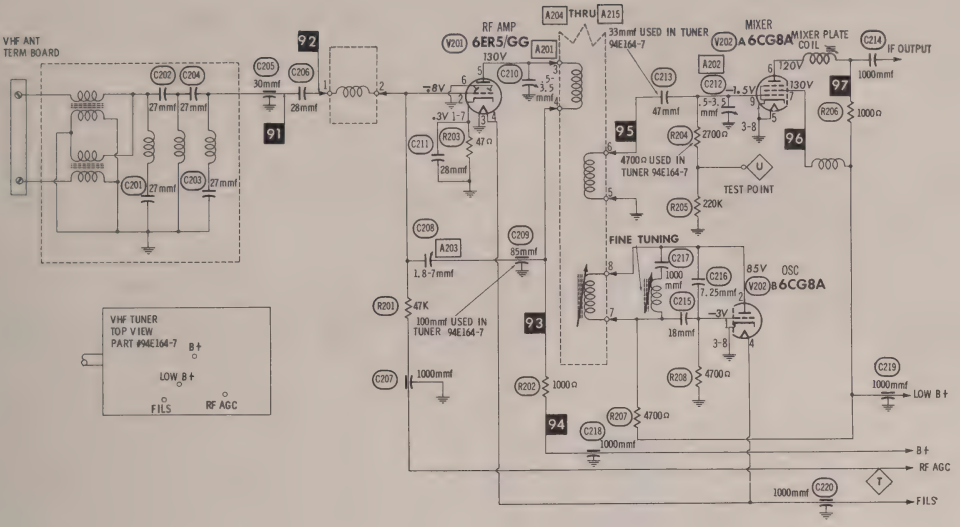
SYNC FAILURE
No vert. sync V5, V10
No horiz. sync V5, V10, Diode (Horiz. AFC)
No vert. or horiz. sync V5, V10



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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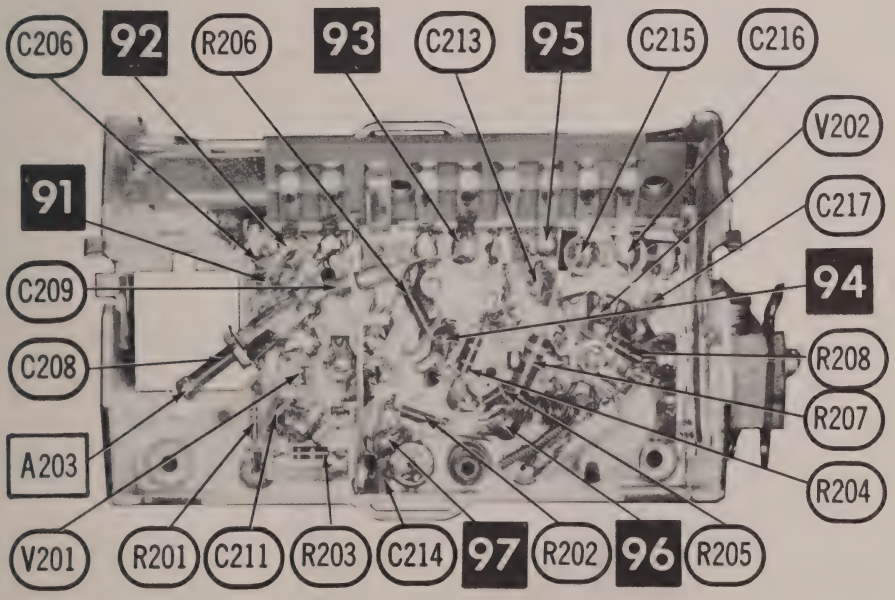
VHF TUNER 94E164-7



A Howard W. Sams CIRCUITRACE Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

TUNER 94E164-7 - BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS

94E164-7

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A204 thru A215 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓣ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Turn Contrast fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. to point Ⓤ Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check to see that other channels have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

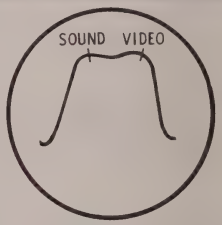


FIG. 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across Video Det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

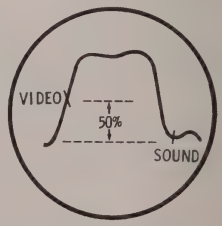


FIG. 202

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
A1 thru A5, A8 thru A12 ..... GENERAL CEMENT #828, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A6, A7 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (A) . Positive to chassis.
Connect a jumper across antenna terminals.
Connect a 270mmf capacitor across VTVM leads.
Set Super-Range Finder fully counterclockwise.
Set Contrast fully clockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	45.3MC	Any non-interfering channel	DC probe thru 10K to TP-1. Common to chassis. (Video Det. load)	Mixer Plate Coil & A1	Adjust for maximum deflection.
2.	"	43.5MC	"	"	A2, A3	"
3.	"	41.5MC	"	"	A4	"
4.	"	42.0MC	"	"	A5	"
5.	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
6.	"	39.75MC	"	"	A7	"
7.	"	47.25MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Leave Super Range Finder fully counterclockwise and Contrast fully clockwise.
If an external marker is used, couple loosely to sweep generator lead.
Connect a 270mmf capacitor across scope leads.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	High side to ungrounded tube shield floating over Mixer-Osc. (V202. Low side to chassis.	44.0MC (10MC Swp)	41.25MC 42.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to TP-1. Low side to chassis.		Check for response curve similar to Fig. 1 with markers as shown. If necessary, re-touch A1 thru A8 for desired response.

SOUND IF ALIGNMENT

Tune in the strongest TV station available in the area. Adjust set for normal operation. Turn A9 slowly counterclockwise until a buzz is heard in the sound, then clockwise for maximum undistorted sound. (If two such points are found to be present use second peak.) Reduce the signal at the antenna terminals until a strong hiss is heard and carefully adjust A10 and A11 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, reduce signal until hiss returns and readjust A10 and A11. If sound is unsatisfactory, repeat procedure.

4.5MC TRAP ALIGNMENT

Tune in strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A12 for MINIMUM beat interference.

FIG.1

CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

ADMIRAL MODELS 5T24M61, 62, 63, 72, 77, 5TR24M81, 82, 83, 92, 97 (Ch. 351, 8W1, 20H6, 20J6)

FOLDER 1

ADMIRAL MODELS 5T24M61, 62, 63, 72, 77, 5TR24M81, 82, 83, 92, 97 (Ch. 351, 8W1, 20H6, 20J6)

CHASSIS BOTTOM VIEW – CAPACITOR & MISC. IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V9	Right Channel Output	EL84/6BQ5
V2	2nd Video IF Amp.	6BZ6	V10	Vert. Mult. -Sync Phase Inv.	6CG7
V3	3rd Video IF Amp.	6CB6	V11	Vert. Mult. -Vert. Output	6EM5
V4	Video Output-Sound IF Amp.	6AW8A	V12	Horiz. Mult.	6CG7
V5	AGC Keying-Noise Limiter-Sync Sep.	6BU8	V13	Horiz. Output	6DQ6A
V6	Audio Det.	6DT6	V14	Damper	6AU4GTA
V7	Left-Right Channel AF Amp.	12AX7A	V15	HV Rect.	1G3GT/1B3GT (1G3GT)*
V8	Left Channel Output	EL84/6BQ5	V16	LV Rect.	5U4GB
			V17	LV Rect.	5Y3GT

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V18	23CP4 23GP4 23HP4		23CP4 ①		23CP4	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	67D15-323	AFH2-64-25	B0483	FP247	TMD-91	TVL-2638	
B	▲100	350							
C2A	▲60	350	67D15-322	AFH4-56-20	D0032	FP430. 95	TMQ-161	TVLS-4607. 7	*
B	■5	350			BR505	FP430. 95			
C	▲50	50							
D	25	50							Note 1
C3	50	350	67D15-226	AFH1-41	A0390	FP137	TMS-46	TVL-1622	
C4	3	350	67B4-40	PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C5	3	350	67B4-40	PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C6	10	350	67B4-51	PRS1620	BR1045	TC62	TD-10-450	TVA-1604	
C7A	■60	350	67D15-336	AFH3-110-50	C1414	FP342. 7	TMT-120	TVL-3723	
B	▲50	25							
C8	10	6	67B35-7	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

Note 1. C2D not used in some applications. In some versions, C2D may be 60mfd ③ 350V.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C10	32 NPO 2.5%	#65D6-157		TCZ-33	C10Q33C		CNO-433	
C11	3-13 N220	#66A38-7						
C12	20 NPO 2.5%	#65D6-143		TCZ-20	C10Q2C			
C13	3-17 NPO	#66A38-11						
C14	9 NPO 2%			TCZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C15	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C16	1.0 100V		P288N-1.0		CUB2W1		GEM-21	2TM-M1
C17	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C18	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C19	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C20	820		DI-820	DD-820	BYA10T82	CCD-821	GP382	10TS-T82
C21	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C22	820		DI-820	DD-820	BYA10T82	CCD-821	GP382	10TS-T82
C23	820		DI-820	DD-820	BYA10T82	CCD-821	GP382	10TS-T82
C24	560 N3300 5%	#65D6-131				*		
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C26	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C27	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C28	820		DI-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C29	3.3 10%		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C30	6.8 10%		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C31	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C32	.22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C33	.022 600V 10%		V84C6S22-10%		PM6S22	6DP-2-223	GEM-16122	6TM-S22
C34	250 3000V N1500 5%	#65D10-114						
C35	.047 1000V		P1088N-047	DD-503	CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C36	.047 1000V		P1088N-047	DD-503	CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C37	.047 1000V		P1088N-047	DD-503	CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C38	20000	(.1mfd 400V) ◆	BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C39	1000 2000V		HVD-30-1000	DD30-102	HVB20D1		2HV-210	30GA-D10
C40	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C41	330	Note 1	BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C42	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C44	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C45	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C46	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C47	100 N150	#65D10-84				*		10TCP-T10
C48	120 N1500	#65D10-211				*		

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C49	220		DI-220	DD-22	L10T22	CCD-22	GF522	10TS-T22
C50	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	56K-D33
C51	10000		BPD-01	DD-103	BYA10S8	CCD-103	GP10	56K-S10
C52	.01 600V		P688N-01	DS-103	CUB8S8	EDF-2-103	GEM-401	6TM-S
C53	.0022 1000V	#65D16-84	P1088N-0022	DD-222	CUB10D22	CCD-222	GEM-10222	10TCP-T10
C54	100 N150	#65D60-211				*		
C55	120 N1500					*		
C56	330		DI-330	DD-22	L10T22	CCD-22	GP322	10TS-T22
C57	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	56K-D33
C58	10000		BPD-01	DD-103	BYA10S8	CCD-103	GP10	56K-S10
C59	.01 600V		P688N-01	DS-103	CUB8S8	EDF-2-103	GEM-10223	6TM-S
C60	.0033 1000V		P1088N-0033	DD-332	CUB10D33	CCD-332		10TM-D33
C61	4mfd 10%		P1222NN-4.0					118P4050B2
C62	4mfd 10%		P1237NN-4.0					118P4050B2
C63	10000		BPD-01	DD-103	BYA10S8	CCD-103	GP10	56K-S10
C64	10000		BPD-01	DD-103	BYA10S8	CCD-103	GP10	56K-S10
C65	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	56K-D47
C66	1000 10%		DE-103	DD-103	1R10	CCD-103	GP10	10TS-D10
C67	1000 1%		DI-1000	DD-102	1R10I	CCD-102	GP10	10TS-D10
C68	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	56K-D47
C69	10000		BPD-01	DD-103	BYA10S8	CCD-103	GP10	56K-S10
C70	2200		BPD-02	DD-222	BYA10D22	CCD-222	GP222	56K-D22
C71	1000 2000V		HVD-1000	DD5D-102	HVB20D1	4DP-3-104	2HV-210	30GA-D10
C72	1. 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	6TM-P1
C73	1. 400V 10%		V84CKP1-10%		PM4P1	4DP-4-534		2WF-S82
C74	.082 200V 10%				1RST82	4DP-4-832		10TM-S83
C75	.032 1000V 10%		P1084CM-033			4DP-3-332	GEM-1633	10TM-D33
C76	1000 2000V		HVD-20-1000	DD20-102	HVB20D1		2HV-210	30GA-D10
C77	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-647	6TM-S47
C78	.01 600V		P688N-01	DS-103	CUB6S8	6DP-3-103	GEM-611	6TM-S
C79	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	56K-D47
C80	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-647	6TM-S47
C81	3300 10%		DS5D39		DS5D39	CM-20B-332K	MC245J	MS-239
C82	820 10%		1469-00082	DD-821	1RST82	CM-20B-821K	MCD45J	MS-382
C83	820 10%		1469-00082	DD-821	1RST82	CM-20B-821K	MC236J	MS-382
C84	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	56K-D47
C85	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-647	6TM-S47
C86	.027 1000V 10%	#64B2-46				16DP-4-303	GEM-1613	
C87	100 4000V N1500 10%	#65D65-213				*		
C88	.047 600V	P688N-047	DD-503		CUB6S47	6DP-3-473	GEM-647	6TM-647

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Admiral Part no. + Alternate value. Note 1 Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
	RESISTANCE	WATTS						
R1A	5meg	½	75C58-1					Balance, Left Channel
B	5meg	½						Balance, Right Channel
C	5meg	½						Loudness, Right Channel
	1.5meg tap	½						
D	1meg	½						Loudness, Left Channel
	1.5meg tap	½						
E	Switch		75B57-1	AB-70	A247-1meg-2		FA18A	Push-Pull Off-On
R2A	1meg	½		B1-70	Not Reg.		R216A	Base, Right Channel
B	1meg	½		AK-8	RB-3/16		C9687 &	Base, Left Channel
C	Shaft						D8-37	
R3A	5meg	½	75B57-2				F256R	Treble, Right Channel
B	5meg	½					R1348R	Treble, Left Channel
C	Shaft						C9687 &	
							D8-37	Selector, (Function) Note 1
R4A	Switch		76C44-1					Contrast, Note 1
B	1000Ω		75B17-35	F1-31	(E)V-65Ω		↑ Ⓐ-1138	Brightness, Note 2
R4A	100K			R3-5				Contrast, Note 2
B	100Ω		75B17-36	F1-31			↑ Ⓐ-1353	Brightness, Note 3
R5A	100K	½		R2-33			* (E)V4098	Vert. Hold, Note 3
B	200K	½	75D30-119	AB-87	B47-5meg-3		BU-141	Super Range Finder
R6A	5meg	½		AK-19	Not Reg.		TM4	
B	Shaft			AK-4	B47-500-3		BU-103	Vert. Lin.
R7A	500Ω	½	75D20-100	AK-19	Not Reg.		TM4	Not Reg.
B	Shaft			AK-4	B47-1.5meg-3		BU-134	PTA35L
R8A	1.5meg	½	75D20-104	AB-742	Not Reg.		TM4	Not Reg.
B	Shaft			AK-19	Not Reg.		BU-139	AGC, Note 1
R9A	100K	½	75D30-117	AB-41	A47-100K-2		TM4	Not Reg.
B	Shaft			AK-1	F32-1/4		BU-139	AGC, Note 2
R9A	100K	½	75D30-118	AB-39	B47-100K-3		BU-138	
B	Shaft			AK-19	Not Reg.		TM4	Not Reg.

† "Concentrist" Equivalent: K-2 Kit with Base Elements & Shafts: BU-138, P1-109 (Panel) BU-106, RL-128 (Rear)
‡ "Concentrist" Equivalent: K-2 Kit with Base Elements & Shafts: BU-138, P1-108 (Panel) BU-139, RL-128 (Rear)
(Not available as a factory assembled unit.)
■ "STA-LOC" Equivalent: FA15L, BU38L, CB31L, BB8L.
▪ "STA-LOC" Equivalent: FA15L, RU25L, CB120A, BT50
Note 1: Used in Ch. 3018E.
Note 2: Used in Ch. 3026.
Note 3: Ch. 3026 uses 200K Vert. Hold (Part #75D3-106).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	3meg	
R11	10meg	
R12	820Ω 2W	
R13	180Ω	
R14	1. 2meg	
R15	150Ω	
R16	1000Ω	
R17	15K	
R18	12K	
R19	39K	
R20	470Ω	
R21	47Ω	
R22	22K	
R23	4700Ω	
R24	4700Ω	
R25	68Ω	
R26	220K	
R27	220K	

ITEM No.	RATING	REMARKS
R28	470Ω	
R29	6800Ω 2W	
R30	330Ω	
R31	3300Ω	
R32	47K	
R33	12K 3W	
R34	82K	
R35	33K 2W	
R36	56000 7W	#61B24-643
R37	25K 1W	
R38	3900 5%	
R39	1K	
R40	82K	
R42	120K	
R43	82K	
R44	150K	
R45	470K	
R46	470K	
R47	680K	
R48	2900Ω	
R49	180K	
R50	100K 1W	
R51	56000 1W	
R52	47000 2W	
R53	100K	
R54	56K	
R55	330K	
R56	56K	
R57	560K	
R58	33K	
R59	82000	

Admiral Part No.

RESISTORS (cont)

ITEM No.	RATING	REMARKS
R60	680Ω	
R61	47K	
R62	3. 3meg	
R63	470K	
R64	1000Ω	
R65	220Ω	
R66	1meg	
R67	1680 2W	
R68	47K	
R69	3. 3meg	
R70	470K	
R71	220Ω	
R72	1meg	
R73	560Ω 2W	
R74	10000 35W	
R75	2200 1W	
R76	1500 3W	
R77	10K 1W	
R78	12meg	
R79	47K	
R80	56K	
R81	15K	
R82	15K	
R83	220K	
R84	470K	
R85	56K	
R86	220K	
R87	1meg	
R88	2. 2meg	
R89	220K	
R90	100Ω	
R91	180Ω 1W	

ITEM No.	RATING	REMARKS
R92	396 1W	
R93	470Ω 3W	#61A1-45
R94	220Ω	
R95	220Ω	
R96	5.6Ω (Cold)	#61A27
R97	22K	
R98	1. 5meg	
R99	6800Ω 1W	
R100	56000 1W	
R101	2200Ω	
R102	2200Ω	
R103	100K	
R104	100K	
R105	470K	
R106	4. 7meg	
R107	10K	
R108	56K	
R109	47K	
R110	82K	
R111	165 5%	
R112	1200Ω 5%	
R113	100Ω	
R114	1meg	
R115	12K 3W	#61B24-351
R116	22K 3W	#61B24-357
R117	6800	
R118	1. 2Ω	#60B38-64
R119	17500 7W	#61B20-27
R120	12K 10W	#61B20-13
R121	470K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rem PART No.	NOTES
L1	41.25MC Trap Coil	TB357-4						1.5ah
L2	79.75MC Trap Coil	TB357-5						
L3	47.25MC Trap Coil	TC2133-44						
L4	1st Video IF	TC2133-43						
L5	2nd Video IF	TC2133-39						
L6	3rd Video IF	TC2133-39	19-1001	19-1001	RC-562	4604		1.4ah
L7	Pil. Choke	TB357-3						Note 1
L8	4th Video IF	TJ81R-3						1ah
L9	RJ Choke	TJ81R-4						500ah
L10	Shunt Peaking Coil	TB35-20	19-3500	19-3500	TY-305	6174	VP-8	20ah
L11	RJ Choke	TJ201-3						
L12A	4.5MC Trap	TJ81R5-2						
N	1st Sound IF							Note 2
L13	Series Peaking Coil	TC35-23						Note 3
L14	Shunt Peaking Coil	TB35-55						
L15A	2nd Sound IF	TJC209-1						
S	Phase Shift Coil							
L16	Quadrature Coil	TC2132-37						

Note 1. Includes C29, C30 and M5. Note 2. Wound on 4700Ω resistor. Note 3. Wound on 10K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rem PART No.	NOTES
	PRI.	SEC.						
L27	100Ω		94C17-7	HB-3 ①	TV-163 ①	6210 ①	H-103 ①	HB-5 ① Horiz Stabilizing ① Enlarge mtg. hole.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	Dynamic Focus	94B17-1								
	380MH Tap @ 85MH									

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (@ CURRENT 1000 ℃μ)	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L19	350A	37Ω	1. 3 Hy.	74B18-39 ①						

① Ch. 3018 uses Part #74B18-30.

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI. SEC. 1 SEC. 2							
T1	117V @ 2.18A; 580VCT @ 350A	5V @ 6A	80D65-18 ①					
	SEC. 3 SEC. 4 SEC. 5							
	6.3V @ 9.6A							

① Ch. 3026 uses Part #80D65-13.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	79C43-19	26B14		V319			26B14	A-140X
	Alt. Vert Output	79D43-19	26B14		V319			26B14	A-140X
	Alt. Vert. Output	79D43-18	26B14		V319			26B14	A-140X
T3	Yoke-Horiz (19MH) (100)—Vert (13.5MH)	84L72-1			Y-10 ‡ ‡ ‡		DY-22A ‡ ‡ ‡	Y-52 ‡ ‡	Y-60 & NW-23 & YC-109 ‡ ‡
	Rear Cover & Centering Device	84C53-1							D-15UR *
T4	Horiz. Output	79E77-1							
	Alt. Horiz. Output	79D77-1							
	Alt. Horiz. Output	79D77-22							

‡ Use original horizontal yoke damping network, if necessary

① Requires new rear cover and centering device.
② Connect same as original.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ITEM No.	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Rem Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
T5	4							4 & 5
	5							
	6							6
	3							3
	7							7
	8							8
	2							2
	1							1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	9500Ω	3-4Ω	79C83-3 ①							‡ Alternate
T6	9500Ω	3-4Ω	79B82-4							Part #79B82-3

SPEAKER

ITEM No.	TYPE: SIZE	HELD	V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	GUAM PART No.	NOTES
SP1	6" x 9"	PM	6-8Ω	76C38-6 *	69AJ26 §	* Left Channel
SP2	5"	PM	6-8Ω	76B139-11 *	5AJ28. §	§ Right Channel
SP3	8" x 8"	PM	6-8Ω	76C38-4 *	69AJ29. §	
SP4	5"	PM	6-8Ω	76B139-11 *	5AJ28. §	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ADMIRAL PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		93B5-4 *	ITT +	IG616 *			* Dual Selenium Diode + Silicon Type, 12 Reg

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	1" length of #26 Wire							

PHONO CARTRIDGE

ITEM No.	ADMIRAL PART No.	REPLACEMENT DATA: ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M3	609C34-1	*93TB	Not Req.	*26S	Not Req.	*STA4-S	N-STA-S

* Includes mount.

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M4	98C95-8	W-103STSS † or W-103STD †♦	S-69 † or S-69X † or S-69XD ♦	† Jewel ♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5	1N87 *		1N636	1N295	1N295	Video Detector (Pigtail) * Alternate 1N87A

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M6	Tuner	94E164-7	VHF
M7	Circuit Breaker	84A17-1	20H6 Chassis, Note 1
	Circuit Breaker	84A17-5	20J6 Chassis, Note 1

Note 1. 1 Amp. Fuse (Part #84A13-40) used as alternate in some models. Replacement should be with original type component in chassis.

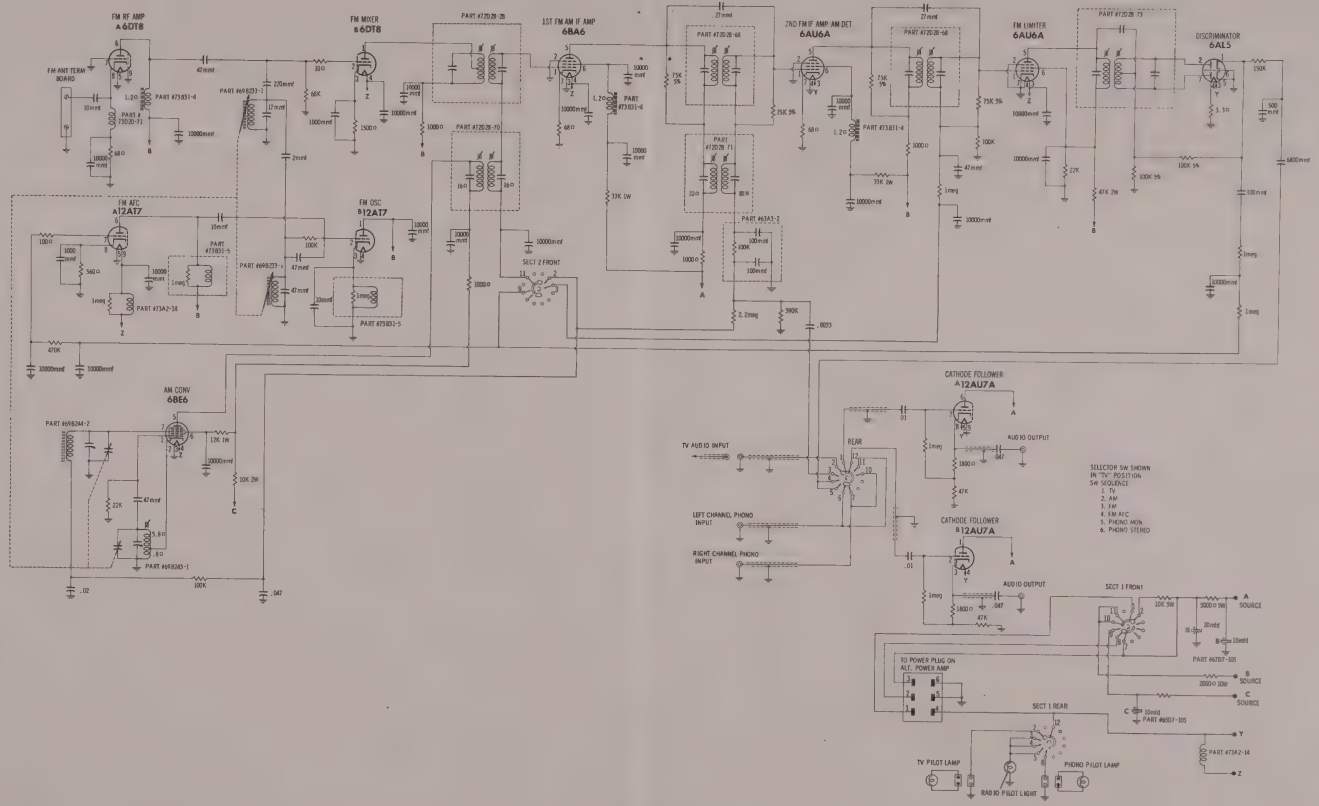
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	20C32-1	VHF Channel Selector
Knob	20C35-1	Fine Tuning
Knob	20C35-2	Off-On Volume, Contrast, Vert. Hold, Models ST24M61, 2, 3, ST24M72, 7
Knob	20C35-2	Off-On Volume, Vert. Hold, Models STR24M81, 2, 3, STR24M92, 7
Knob	33B289-1	Brightness
Knob	20C35-1	Contrast, Models STR24M81, 2, 3, STR24M92, 7, Treble & Bass-All models
Knob	33B289-2	Balance
Knob	33B372-2	Function, Models ST24M61, 2, 3, ST24M72, 7
Knob	700A208-2	Function, Models STR24M81, 2, 3, STR24M92, 7
Knob	33D385-3	Radio Tuning, Models STR24M81, 2, 3, STR24M92, 7
Cabinet	35E573-1	Model ST24M61
Cabinet	35E573-2	Model ST24M62
Cabinet	35E573-3	Model ST24M63
Cabinet	35E572-2	Model ST24M72
Cabinet	35E572-7	Model ST24M77
Cabinet	35E574-1	Model STR24M81
Cabinet	35E574-2	Model STR24M82
Cabinet	35E574-3	Model STR24M83
Cabinet	35E575-2	Model STR24M92
Cabinet	35E575-7	Model STR24M97
Handle	37B216-2	

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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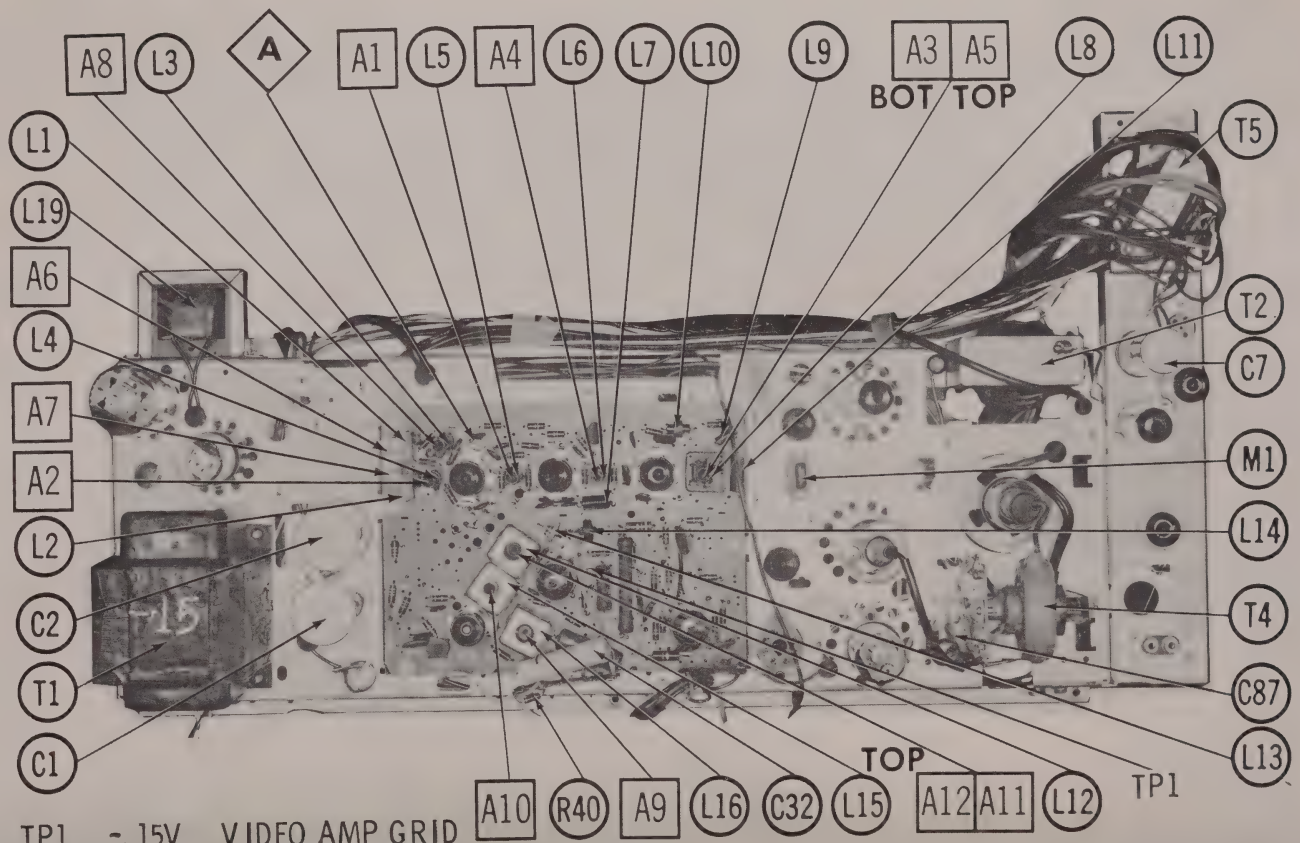
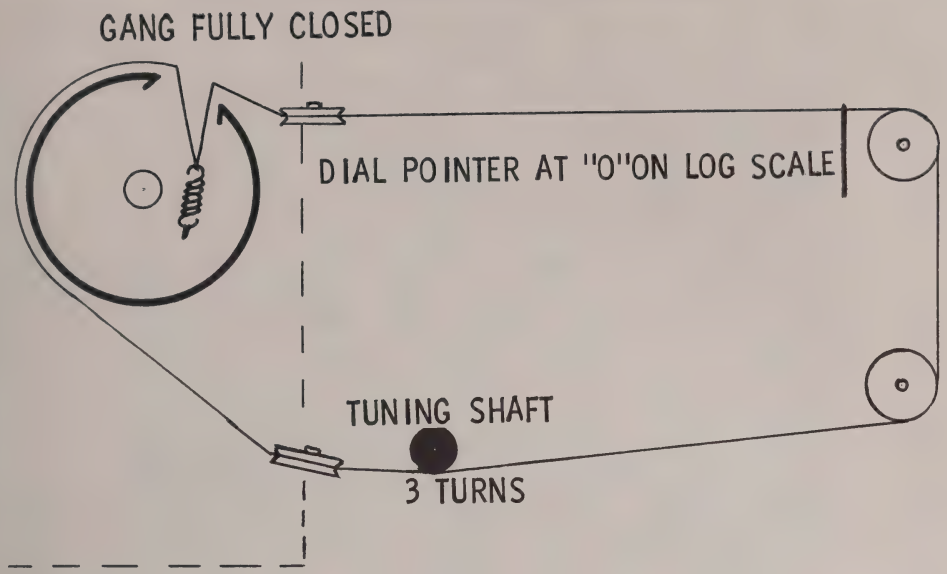
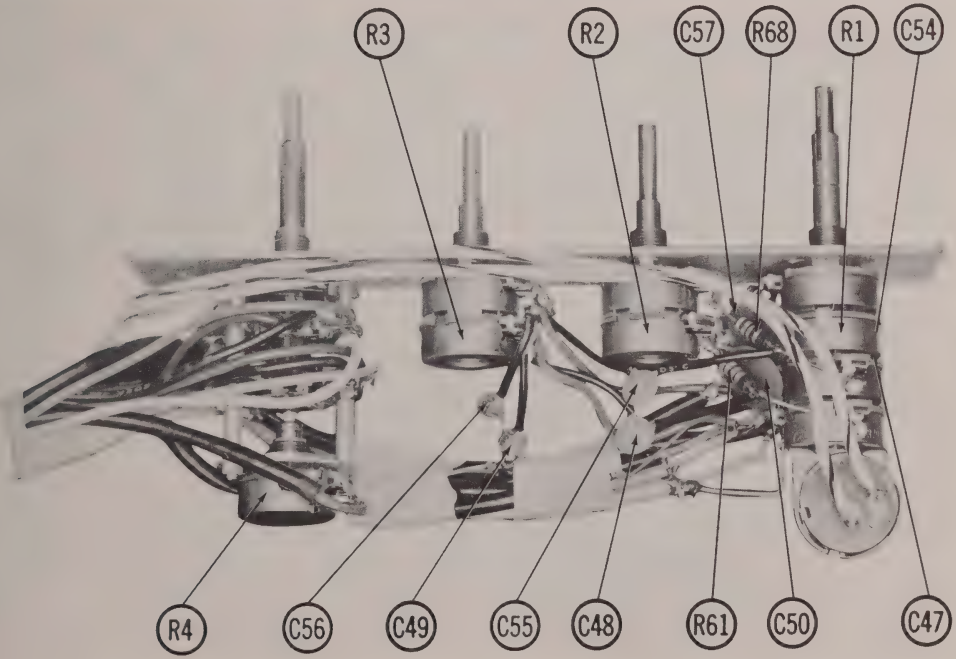
FM-AM TUNER 8W1



CHASSIS - TOP VIEW



FM-AM TUNER 8W1 DIAL CORD STRINGING



CONTROL PANEL

TUNER PARTS LIST AND DESCRIPTIONS

94E164-7

TUBES

CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA

ITEM No.	USE	TYPE
V201	RF Amplifier	6ER5/GG

ITEM No.	USE	TYPE
V202	Mixer-Oscillator	6CG8A (6CG8)*

*Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	27		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C202	27		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C203	27		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C204	27		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C205	30							
C206	28		DI-27	TCZ-27	C10Q27C	CCTO-270		10TCC-Q27
C207	1000		EF-001	MFT-1000		CCF-102	CT280A	
C208	1.8-7			829-7				
C209	85							
C210	.5-3.5							
C211	28		DI-27	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C212	.5-3.5							
C213	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C215	18		DI-18	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C216	7.25				C10V7C	L10V7		10TS-V75
C217	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1000Ω	
R203	47Ω	

ITEM No.	RATING	REMARKS
R204	2700Ω	(4700Ω) *
R205	220K	
R206	1000Ω	

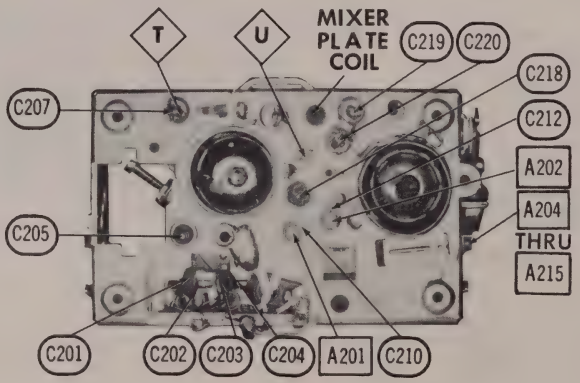
ITEM No.	RATING	REMARKS
R207	4700Ω	
R208	4700Ω	

* Alternate value.

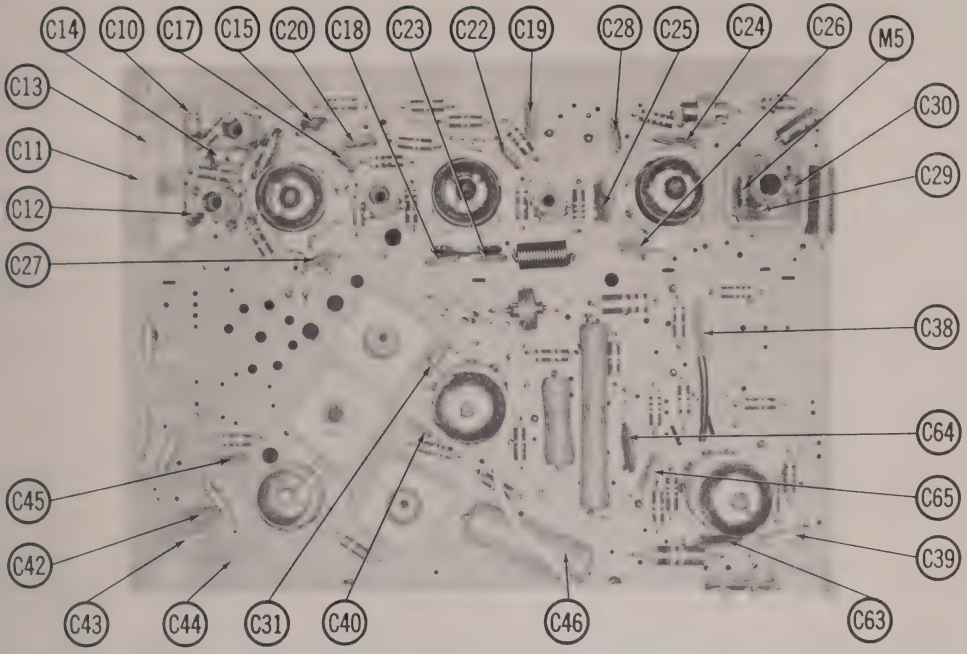
COILS (RF-IF)

ITEM No.	USE	ADMIRAL PART No.	NOTES
L201A	Ant., RF, Mixer Grid & Osc.Coils	94D164-52	Channel 2
B	"	94D164-53	Channel 3
C	"	94D164-54	Channel 4
D	"	94D164-55	Channel 5
E	"	94D164-56	Channel 6
F	"	94D164-57	Channel 7

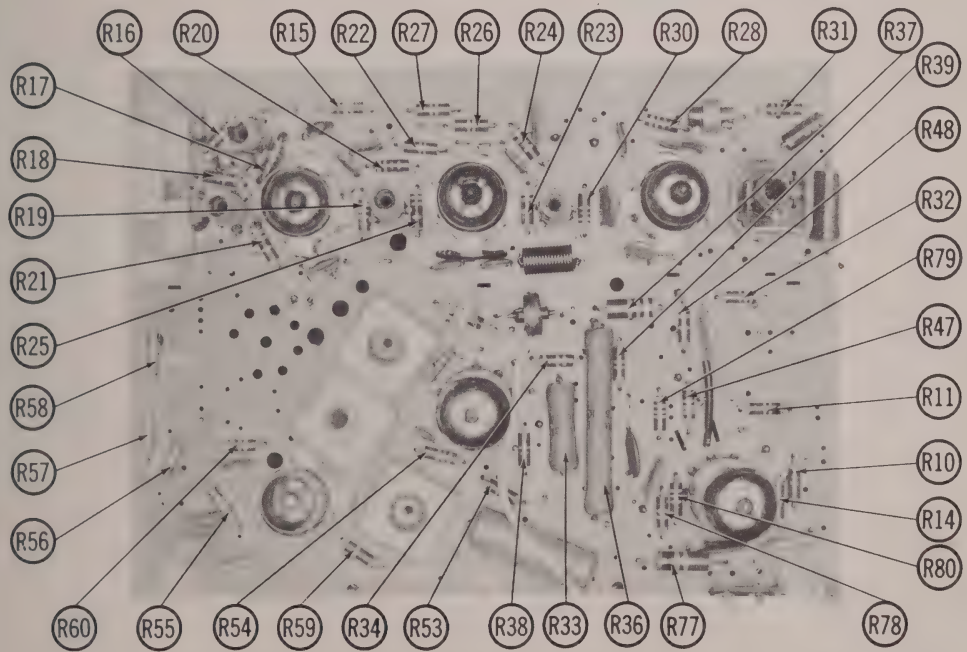
ITEM No.	USE	ADMIRAL PART No.	NOTES
L207G	Ant., RF, Mixer Grid & Osc.Coils	94D164-58	Channel 8
H	"	94D164-59	Channel 9
I	"	94D164-60	Channel 10
J	"	94D164-61	Channel 11
K	"	94D164-62	Channel 12
L	"	94D164-63	Channel 13



TUNER 94E164-7 TOP VIEW

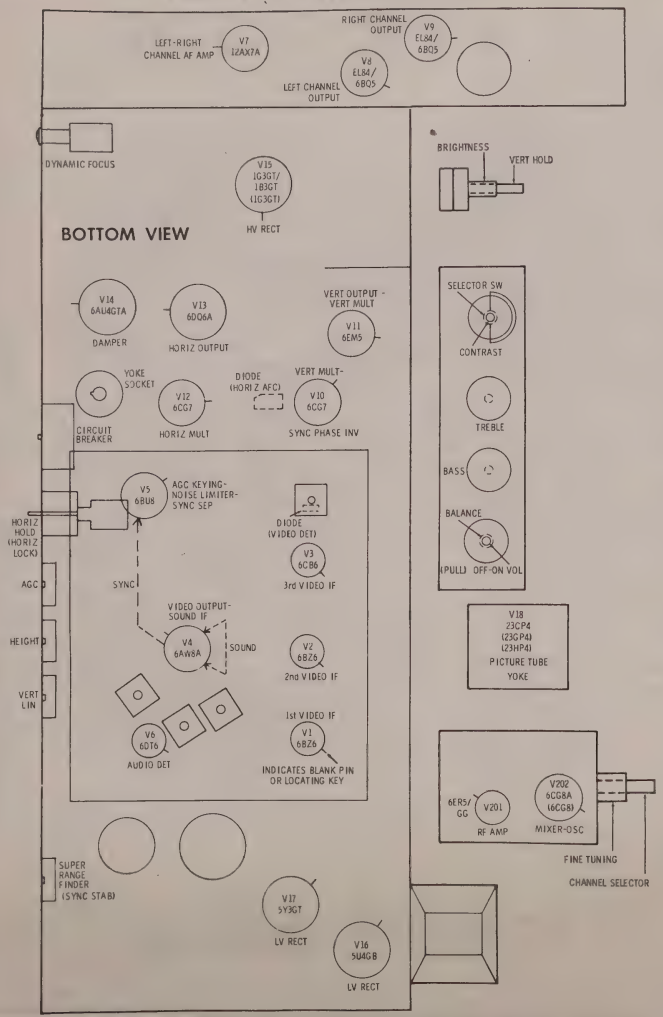


PRINTED BOARD - CAPACITOR & MISC. IDENT.



PRINTED BOARD - RESISTOR & INDUCTOR IDENT.

TUBE PLACEMENT CHART

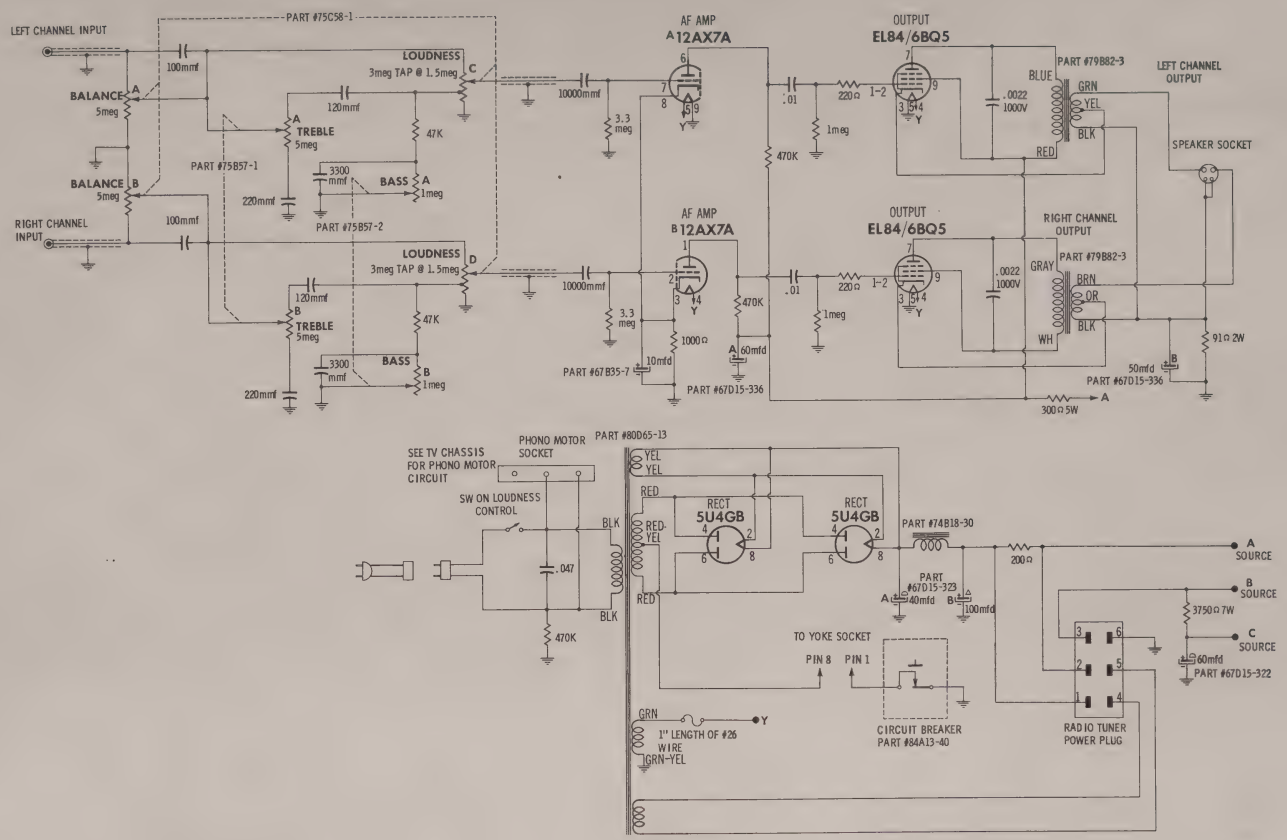


RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	47Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V2	6BZ6	120K	▲ 68Ω	.1Ω	0Ω	† 470Ω	† 470Ω	140K		
V3	6CB6	.1Ω	330Ω	.1Ω	0Ω	† 7300Ω	† 7300Ω	0Ω		
V4	6AW8A	0Ω	100K	† 50K	0Ω	.1Ω	● 40Ω	3300Ω	† 9500Ω	† 5600Ω
V5	6BU8	10K	† 10K	2.3meg	0Ω	.1Ω	● † 13K	● † 2.2meg	† 35K	† 12meg
V6	6DT6	17Ω	680Ω	.1Ω	0Ω	† 390K	† 12K	560K		
V7	12AX7A	† 470K	3.3meg	1000Ω	0Ω	0Ω	† 470K	3.3meg	1000Ω	.1Ω
V8	EL84/ 6BQ5	1meg	1meg	150Ω	.1Ω	0Ω	NC	† 870Ω	NC	† 560Ω
V9	EL84/ 6BQ5	1meg	1meg	150Ω	.1Ω	0Ω	NC	† 900Ω	NC	† 560Ω
V10	6CG7	● † 1.3meg	220K	● 100K	0Ω	.1Ω	† 18K	† 4.7meg	3300Ω	0Ω
V11	6EM5	† 100Ω	NC	2.2meg	0Ω	.1Ω	2.2meg	● 400Ω	NC	† 770Ω
V12	6CG7	† 10K	5.2meg	1200Ω	.1Ω	0Ω	† 82K	47K	1200Ω	0Ω
V13	6DQ6A	NC	0Ω	TP	† 12K	1meg	TP	.1Ω	0Ω	TOP CAP † 9Ω
V14	6AU4GTA	NC	NC	¶ 700K	NC	† 0Ω	NC	.1Ω	0Ω	
V15	1G3GT/ 1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP † 439Ω
V16	5U4GB	NC	¶	NC	24Ω	NC	22Ω	NC	¶	
V17	5Y3GT	NC	¶	NC	24Ω	NC	22Ω	NC	¶	
V18	23CP4	.1Ω	39K	† 120K	120K	NC	NC	● 95K	0Ω	
V201	6ER5/ GG	47Ω	3.8meg	0Ω	.1Ω	† 9200Ω	0Ω	47Ω		
V202	6CG8A	4700Ω	† 9700Ω	0Ω	.1Ω	0Ω	† 6000Ω	† 5000Ω	0Ω	225K
ITEM	TUBE	Pin 1	Pin 2	Pin3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

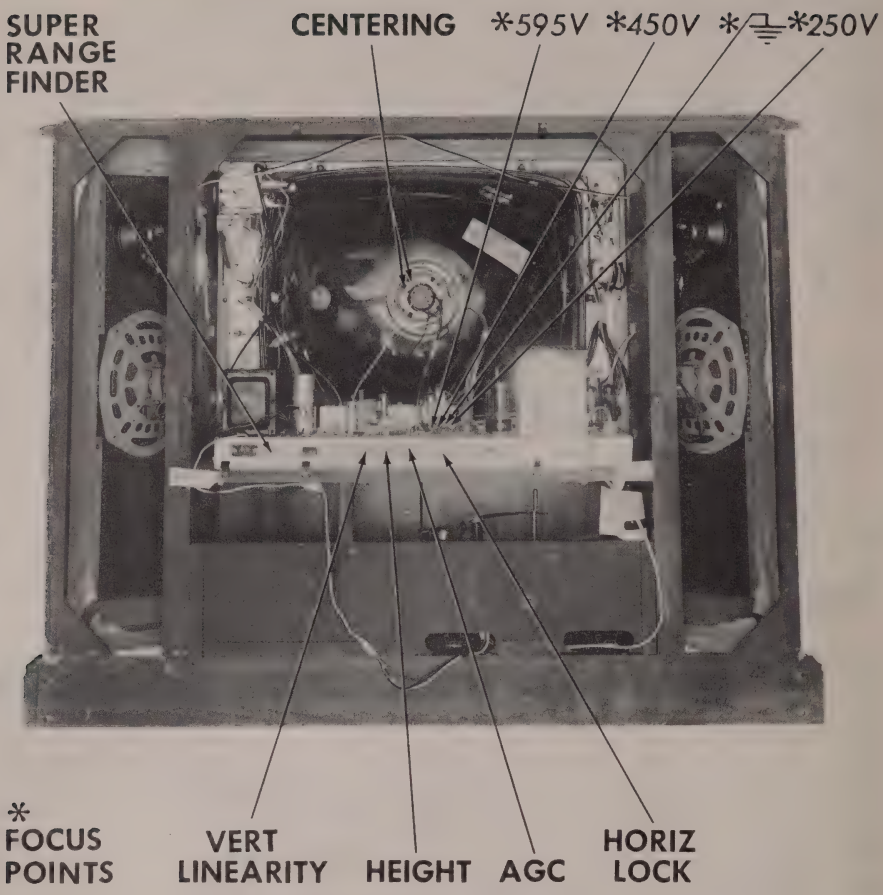
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 255V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.

NC NO CONNECTION.
TP TIE POINT.



STEREO AMP CHASSIS 3S1 USED WITH TV CHASSIS 20J6

ADMIRAL MODELS 5T24M61, 62, 63, 72, 77, 5T24M81, 82, 83, 92, 97 (Ch. 3S1, 8W1, 20H6, 20J6)



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Lock clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Lock slowly counterclockwise until the picture just falls into sync.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL FOR MODEL ST24M72

1. Remove rear cover by depressing 9 spring clips. Remove antenna lead.
2. Remove speaker leads, phono power lead, phono input plugs, and dial lamp leads.
3. Remove 3 chassis bolts from bottom of chassis.
4. Remove 4 bolts from inside the cabinet holding front escutcheon to the cabinet.
5. Remove chassis by sliding out the front of the cabinet.

PICTURE TUBE REMOVAL

1. Remove chassis.
2. Remove HV lead, picture tube socket and yoke plug.
3. Lay picture tube face down on a soft surface.
4. Remove 4 screws holding picture tube support wire.
5. Remove picture tube.

PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL MODELS 17TI, 21C3, 21K2, 21T2
(Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

PACKARD-BELL MODELS 17TI, 21C3, 21K2, 21T2
(Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

MODEL 21KC (Ch. TVP-2, TVT-2, 7TU-3)

PACKARD-BELL MODELS 17TI, 21C3, 21K2, 21T2
(Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL MODELS 17T1, 21C3, 21K2, 21T2 (Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

PACKARD-BELL MODELS 17T1, 21C3, 21K2, 21T2 (Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

MODEL 21KC (Ch. TVP-2, TVT-2, 7TU-3)

TRADE NAME	Packard-Bell	MODELS	CHASSIS (Power)	(Tuner)	(FM-AM Tuner)
		17T1	TVP-1	TVT-1	
		21C3	TVP-1	TVT-1	
		21K2	TVP-2	TVT-2	7TU-3
		21T2	TVP-1	TVT-1	
MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 So. Figueroa St., Los Angles 7, Calif.				
TYPE SET	Television Receiver (Model 21K2 with FM-AM Tuner and 4 Speed Record Changer)				
TUBES	TV: VHF-Nineteen, UHF-Twenty FM-AM Tuner - Seven				
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING TV: 220 Watts, 1.9 Amp. @ 117 Volts AC				
TUNING RANGE	TV: Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) FM: 88-108MC, IF 10.7MC AM: 530-1620KC, IF 455KC				

FOR SERVICE INFORMATION ON RECORD CHANGER PART #58076, V-M MODEL 1201, SEE PHOTOFACT SET 436 FOLDER 18. FOR SERVICE INFORMATION ON RECORD CHANGER PART #58074D, COLLARO "CONQUEST", SEE PHOTOFACT SET 408 FOLDER 6.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Insert a business card between glass and lower trim strip left of center.
Slide card to right until trim mounting spring is depressed.
Lift trim off and tilt glass out at bottom to remove.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of an AGC (Local-Dist.) control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

SYNC STABILITY

Sync stability may be varied by means of a Pix Lock control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A7) located on bottom of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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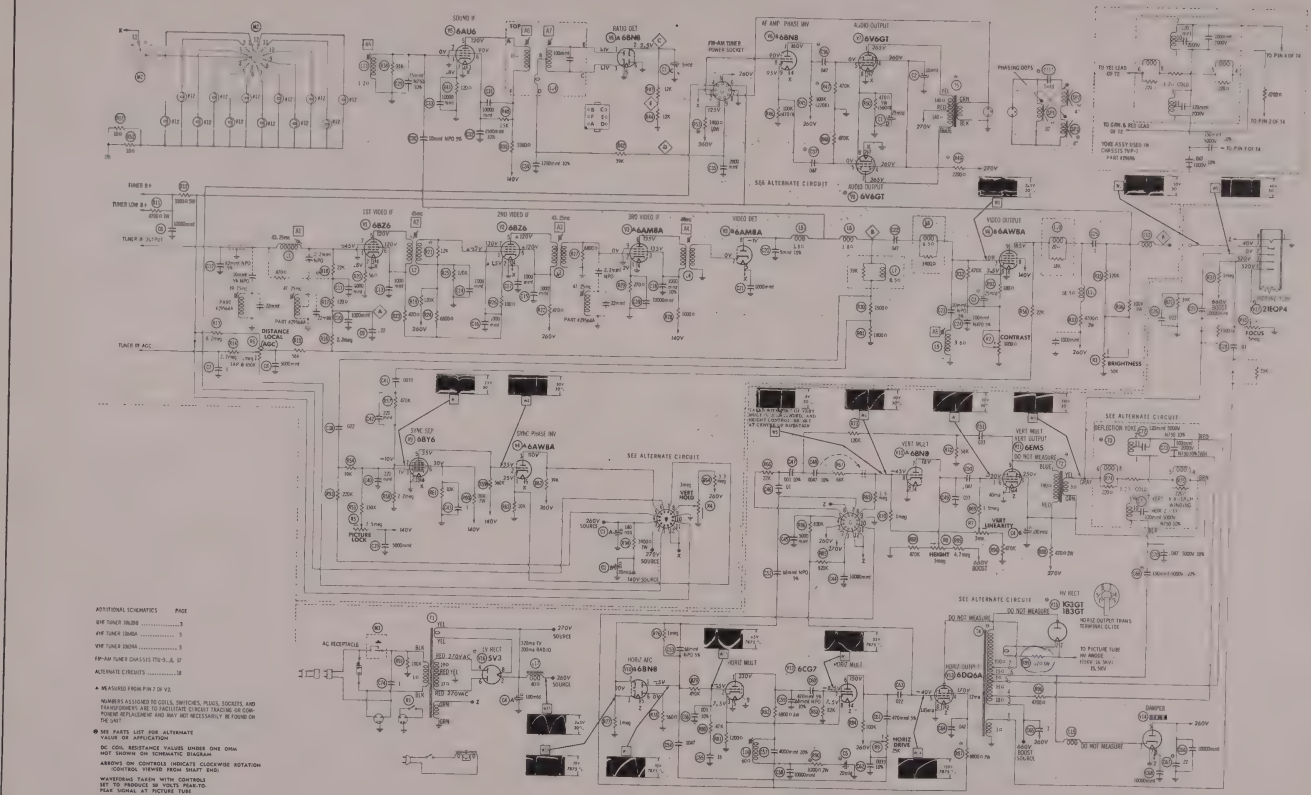
JC857

SET 482 FOLDER 2



ADDITIONAL SCHEMATICS PAGE

UHF TUNER 10U50 3
VHF TUNER 10U60 5
VHF TUNER 10U74 5
FM-AM TUNER CHASSIS 7TU-3, 5, 17
ALTERNATE CIRCUITS 18

▲ MEASURED FROM PIN 7 OF V2.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END).

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt.
2 Pin numbers are counted in clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated.
4 Line Voltage maintained at 117 volts for voltage readings.
5 All controls set for normal operation, no signal applied

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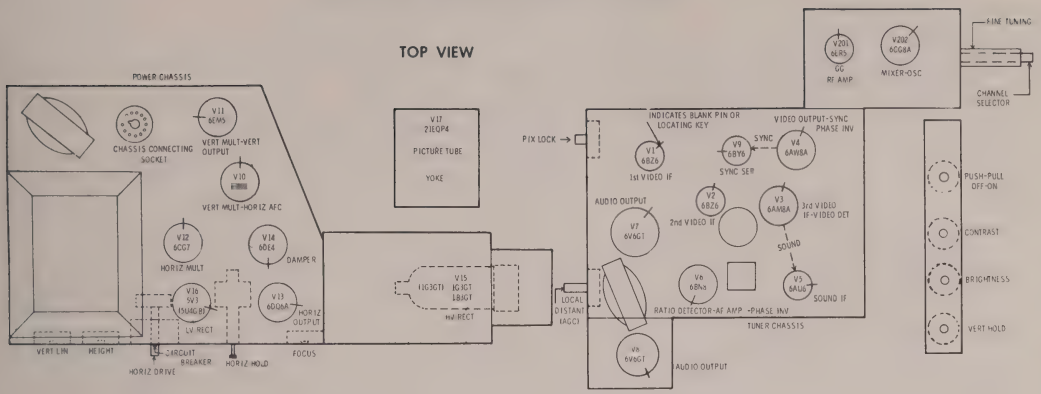
PACKARD-BELL MODELS 1771, 21C3, 21K2, 2112
(Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

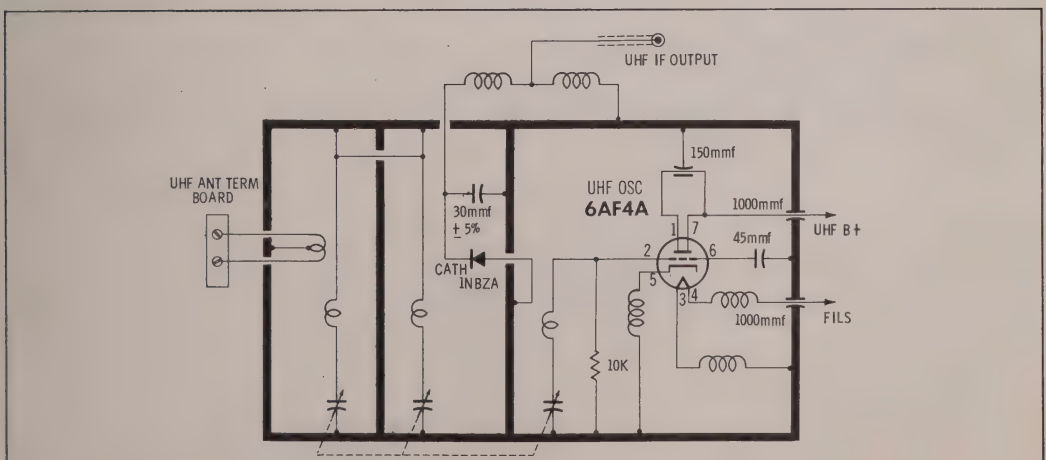
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V16

SWEEP FAILURE
No raster, has sound V12, V13, V14, V15, V17
No vertical deflection V10, V11
Poor vert. linearity or foldover V10, V11
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V10
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V5, V6, V7, V8

SYNC FAILURE
No vert. sync V4, V9
No horiz. sync V4, V9, V10
No vert. or horiz. sync V4, V9



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UHF TUNER 10620B

SET 482 FOLDER 2

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

A1 thru A5, A16 thru A19	GENERAL CEMENT #8721, 8722 WALSCO #2519
A6, A7, A14, A20, A21	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A8 thru A12	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532
A13, A15, A22, A23	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	Not used	45.0MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	Mixer Plate Coil	Adjust for maximum deflection.
2.	"	"	43.25MC	"	"	A1	"
3.	"	"	45.0MC	"	"	A2	"
4.	"	"	43.25MC	"	"	A3	"
5.	"	"	44.0MC	"	"	A4	"
6.	"	44.0MC (10MC Swp)	41.25MC 43.3MC 45.0MC 45.75MC	"	Vert. Amp. thru 22K to point (B). Low side to chassis.		Check for response similar to Fig. 1. If necessary retouch Mixer Plate Coil and A1 thru A4 as required to obtain desired response. Mixer Plate Coil controls position of 45.75MC marker. A1 controls tilt, flatness and overall bandwidth, A2 controls 45.0MC marker , A3 helps to control bandwidth on low frequency side and A4 affects tilt and flatness of response.

For chassis containing IF traps, adjust A2 to 43.25MC and A3 to 45.0MC. Adjust traps to frequencies shown on schematic.

SOUND IF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	High side thru .01mfd to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A5, A6	Adjust for maximum deflection.
8.	"	"	"	DC probe to point (D). Common to point (E).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	High side thru .01mfd to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to point (F). Common to chassis.	A8	Adjust for MINIMUM deflection.

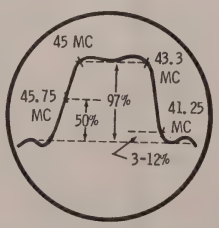
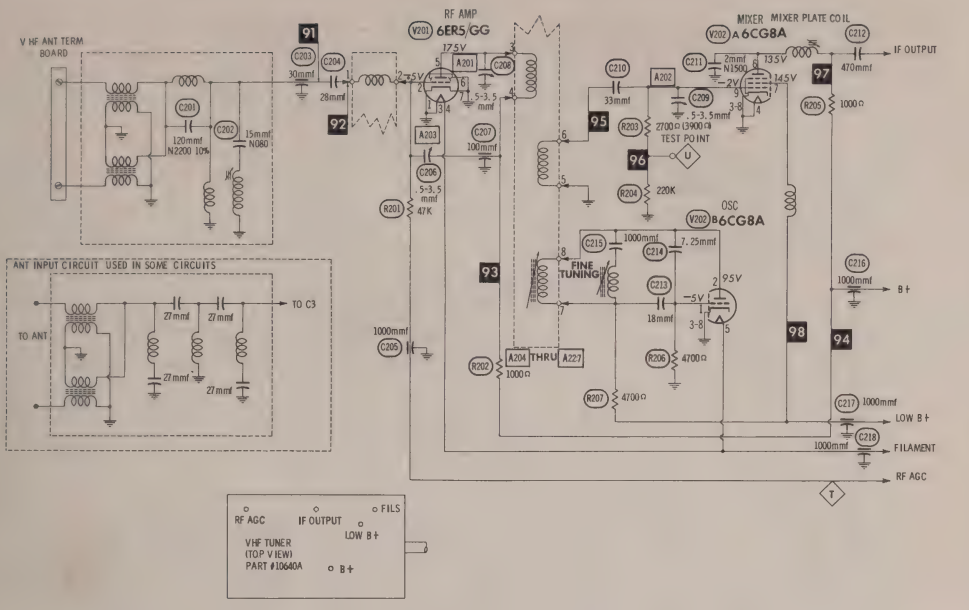


FIG.1



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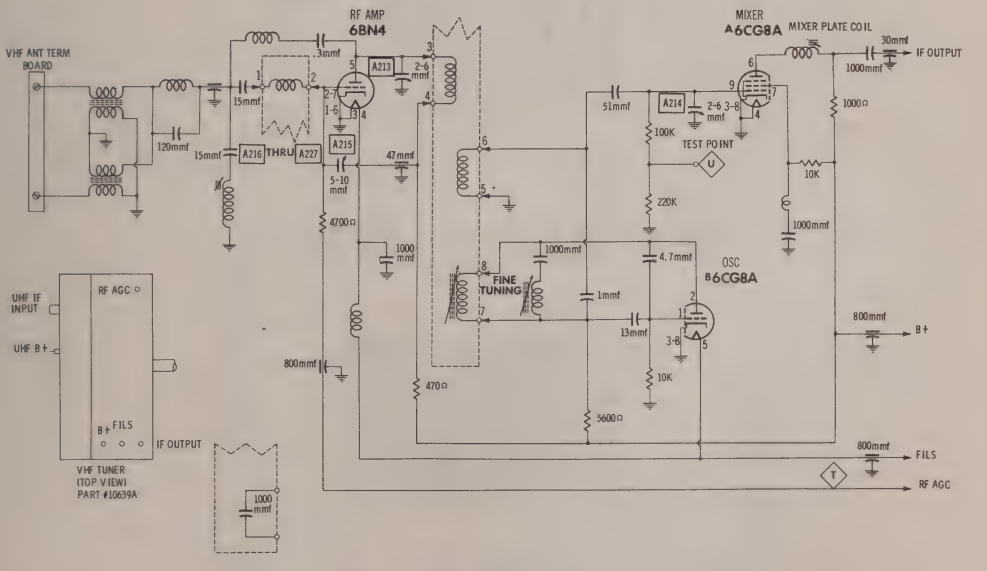
VHF TUNER 10640A



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VHF TUNER 10639A

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6ER5/GG	V202	Mixer-Osc.	6CG8A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R201	47K		R204	220K		R207	4700Ω	
R202	1000Ω		R205	1000Ω				
R203	2700Ω	(3900Ω) *	R206	4700Ω				

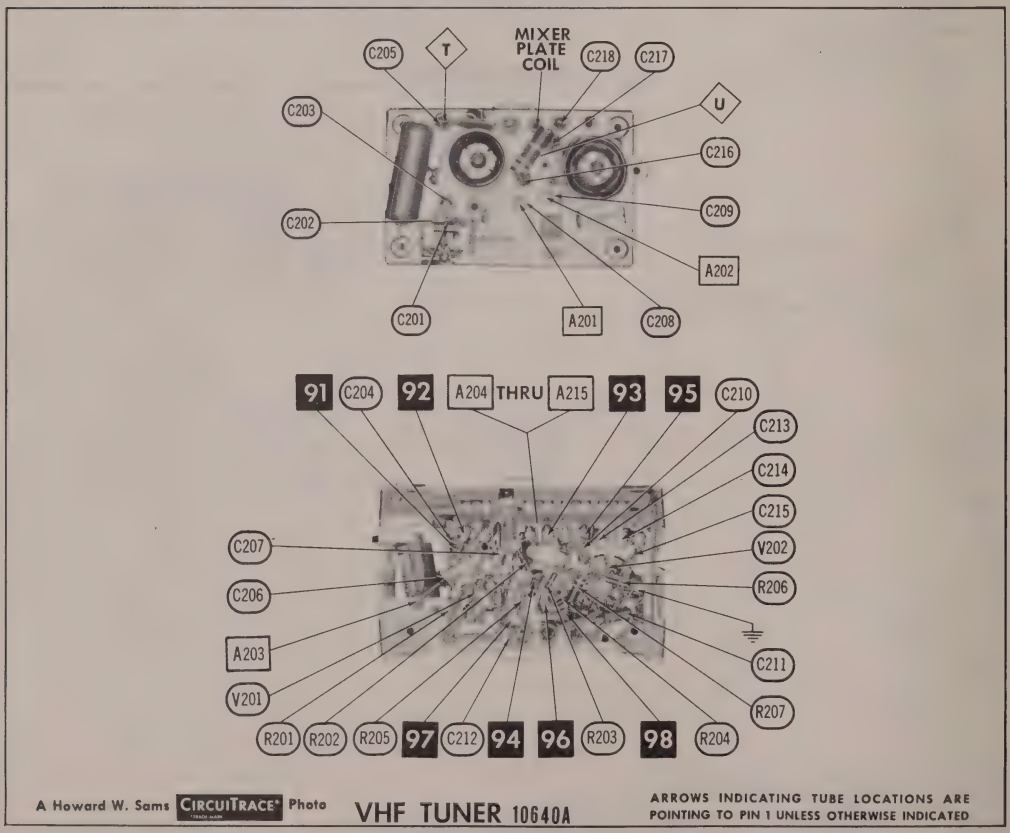
* Alternate value.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N2200 10%					*		
C202	15 N080					*		
C203	30							
C204	28			TCZ-30	C10Q3C	CCTO-300	CNO-427	10TCC-Q30
C205	1000		EF-001	MFT-1000		CCF-001	CT280A	
C206	.5-3.5							
C207	100		EF-0001	MFT-100				
C208	.5-3.5							
C209	.5-3.5							
C210	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C211	2 N1500					*		
C212	470		DI-470	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C213	18		NPO-DI 20	DTZ-20	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C14	7.25				C10V8C			10TS-V75
C215	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.



A Howard W. Sams CIRCUITRACE® Photo **VHF TUNER 10640A**

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

AM-FM TUNER ALIGNMENT INSTRUCTIONS

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM converter Low side to chassis.	455KC (400% Mod)	(AM) Tuning gang fully open	DC probe to point Ⓖ. Common to chassis.	A9, A10, A11, A12	Adjust for maximum deflection.
2.	Loop	1620KC	"	"	A13	"
3.	"	530KC	Tuning gang fully closed	"	A14	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	1500KC	Tune to 1500KC signal	"	A15	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod)	FM Point of non-interference	DC probe to point Ⓖ. Common to chassis.	A16, A17, A18, A19	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓗ. Common to chassis.	A20	"
7.	"	"	"	DC probe to point Ⓙ. Common to chassis.	A21	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE- SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	FM Point of non-interference	Vert. Amp. to point Ⓖ. Low side to chassis.	A16, A17, A18, A19	Adjust for maximum gain and symmetry of response similar to Fig. 2.
6.	"	"	"	Vert. Amp. to point Ⓗ. Low side to chassis.	A20	Disconnect Stabilizing Capacitor. Adjust for maximum gain and symmetry of response similar to Fig. 2.
7.	"	"	"	Vert. Amp. to point Ⓙ. Low side to chassis.	A21	Adjust to place marker at the center of cross-over lines similar to Fig. 3. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

AFC switch pulled out to "OFF" position.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 150Ω in each lead.	106MC (Unmod)	FM 106MC	DC probe to point Ⓖ. Common to chassis.	A22, A23	Adjust for maximum deflection.
9.	"	92MC	92MC	"	L20, L21	Adjust for maximum deflection by compressing or expanding coil turns.

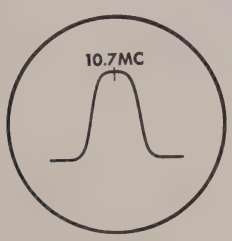


FIG 2

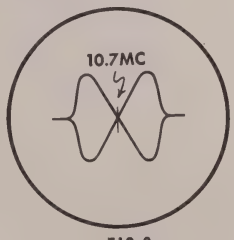
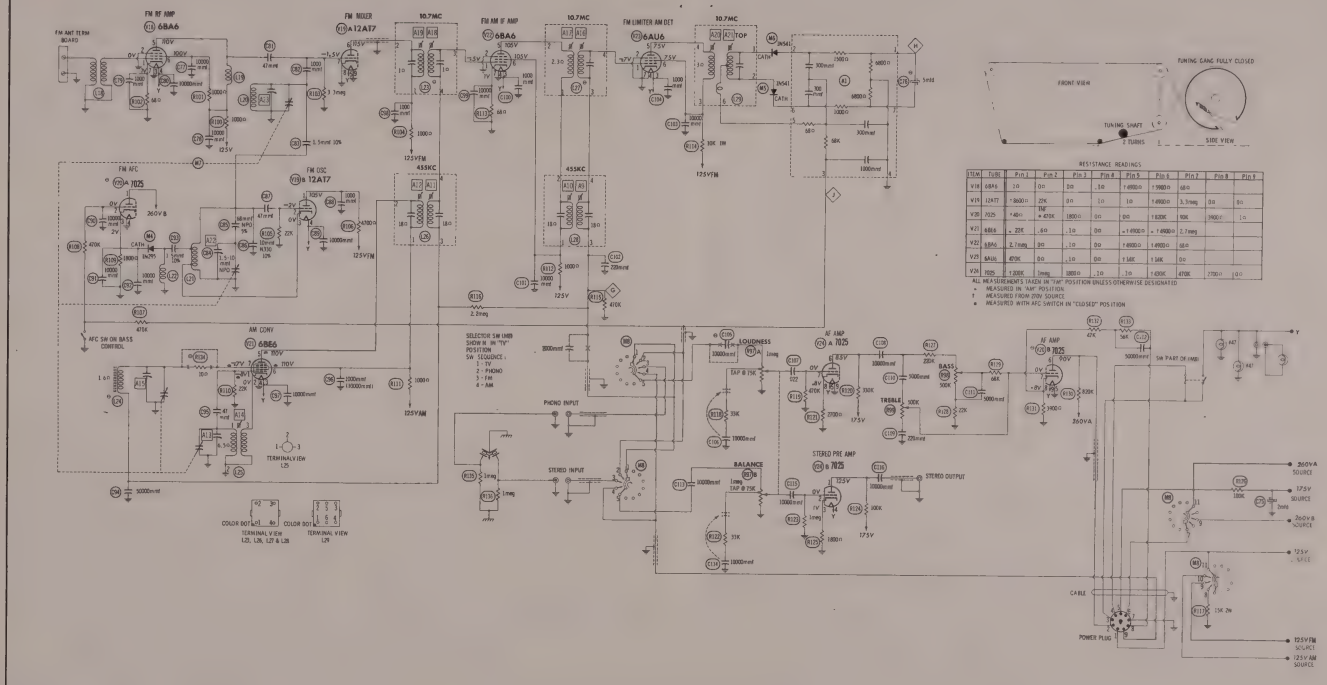


FIG 3



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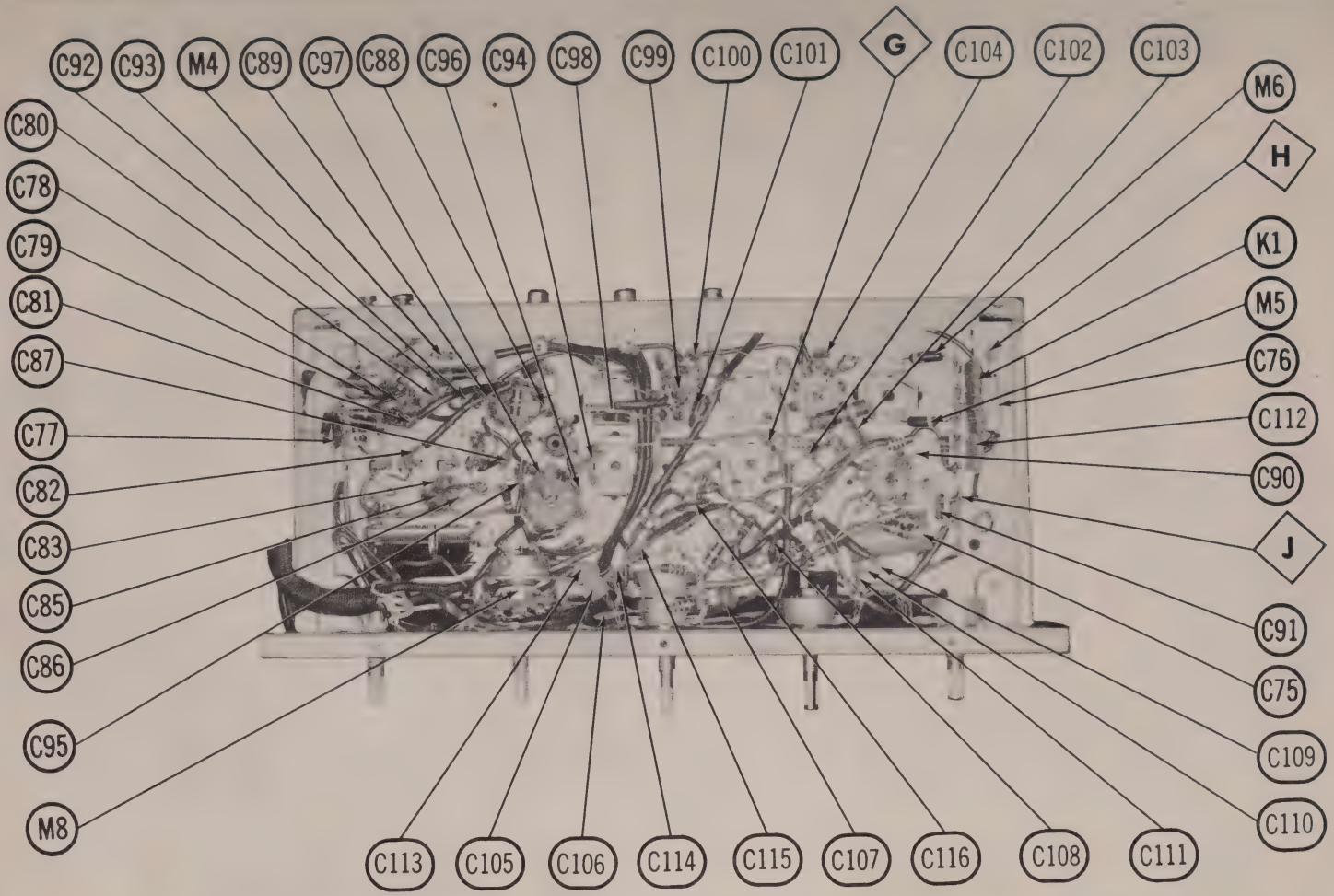
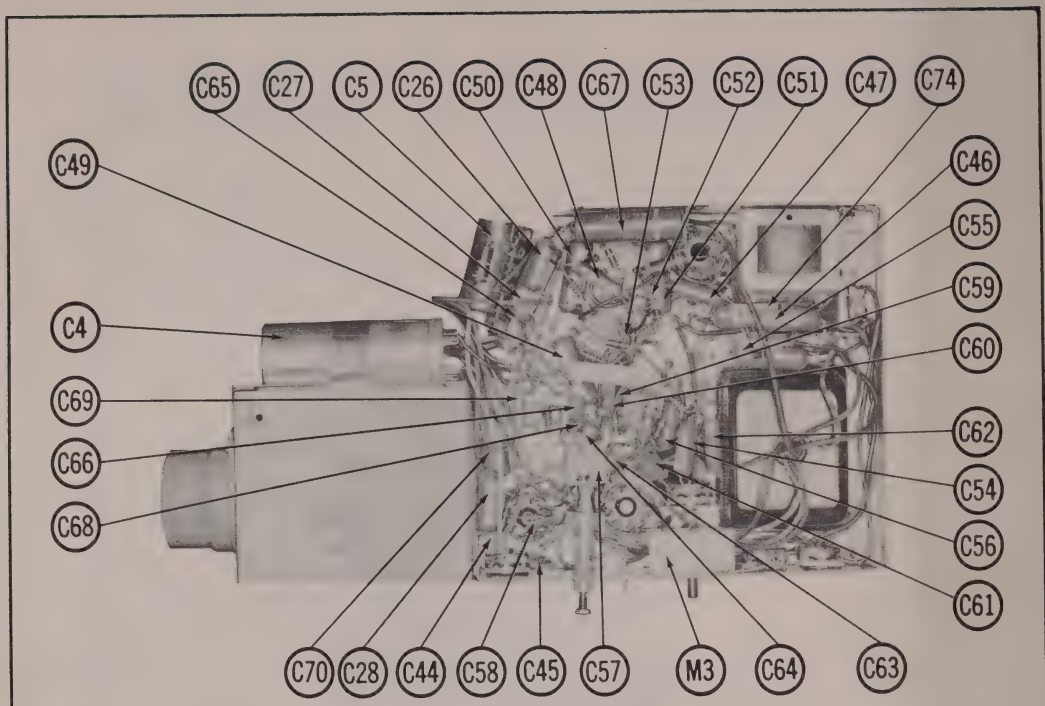
FM-AM TUNER CHASSIS 7TU-3

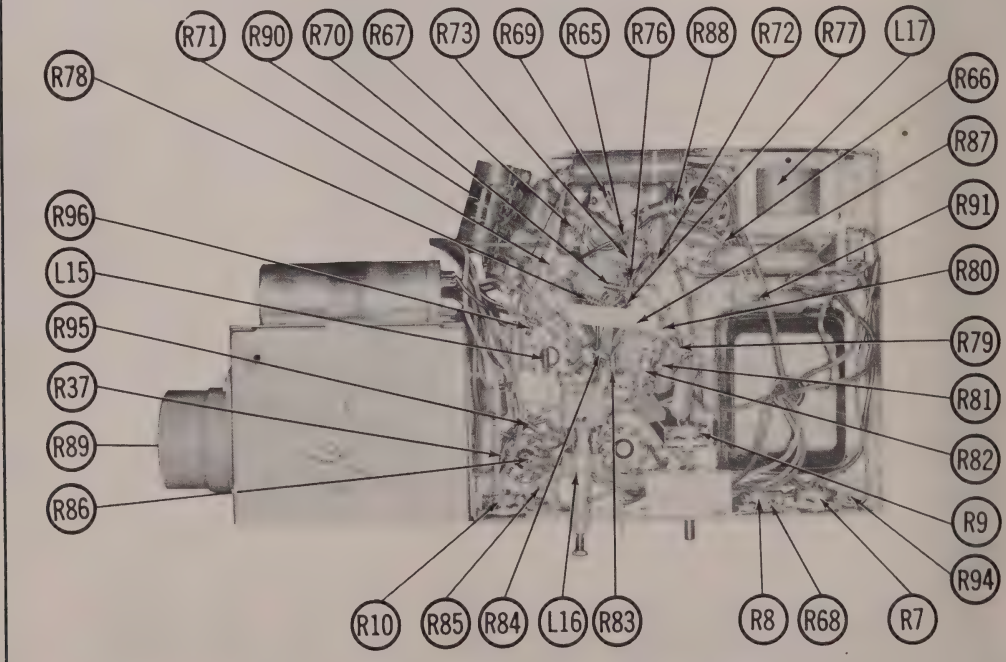


FM-AM TUNER CHASSIS 7TU-3 BOTTOM VIEW - CAPACITOR & MISC. IDENT.

PACKARD-BELL MODELS 1771, 21C3, 21K2, 2112
(Ch. TVP-1, TVP-2, TVT-1, TVT-2, 7TU-3)



POWER CHASSIS TVP-2 - BOTTOM VIEW



POWER CHASSIS TVP-2 - BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp. - Video Det.	6AM8A
V4	Video Output-Sync Phase Inverter	6AW8A
V5	Sound IF Amp.	6AU6
V6	Ratio Detector-AF Amp. - Phase Inverter	6BN8
V7	Audio Output	6V6GT

ITEM No.	USE	TYPE
V8	Audio Output	6V6GT Note 1
V9	Sync Separator	6BY6
V10	Vert. Mult. - Horiz. AFC	6BN8
V11	Vert. Mult. - Vert. Output	6EM5
V12	Horiz. Mult.	6CG7
V13	Horiz. Output	6DQ6A
V14	Damper	6DE4
V15	HV Rect.	1G3GT/1B3GT (1G3GT) *
V16	LV Rect.	5V3 Note 2

Note 1. Not used in Ch. TVT-1. Note 2. Chassis TVP-1 uses 5U4GB. * Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V17	21EQP4 17DKP4		21EQP4 ①		21EQP4 ②	① Aluminized. ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲140	350	24186	AFH4-56-94.8	XC0875.5	FP421.3		TVLS-4607.3*	
B	■20	350			BBR5-50	TC78			
C	▲5	50							
D	25	25							
C2	10	350	24157	PRS1620	BR1045	TC62	TD-10-450	TVA-1604	
C3	25	25	24006A	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	Note 1
C4A	▲100	350	24166	AFH2-41-50	B0332	FP227.7	TMS-61	TVL-2641	
B	▲100	350					TD-100-450		
C5	20	350	24064	PRS1735	BR2035	TC65	TD-20-350	TVA-1608	Note 2

Note 1. Not used in Ch. TVT-1. Note 2. Not used in Ch. TVP-1.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C9	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C12	82 NPO 5%			DTZ-82	C10Q82C	CM-15-E-820J	CNO-482	10TCC-Q82
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C17	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C18	1000 10%		DI-1000	DD-102	PM6DI	CCD-102	GP210	10TS-D10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C20	5 10%		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TS-V50
C21	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C22	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C23	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C24	100 N470 5%					*		
C25	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C26	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-2122	2TM-S22
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C29	75 N750 10%		N750-DI 75	DTN-75	C10Q75U	CCTO-750	CN7-475	10TCU-Q75
C30	10 NPO 5%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C32	1500 10%		DI-1500	DD-152	PM6DI5	CCD-152	GP215	10TS-D15
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP103	5HK-S10
C34	1200 10%		DI-1 200	DD-122	1R5D12	CCD-122	GP212	10TS-D12
C35	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C36	.047 600V	Note 1	P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C37	.047 600V	Note 1	P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C38	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C39	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C40	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C41	.0033 400V		P488N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C42	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C43	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C45	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C46	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C47	.001 600V 10%		V84C6DI-10%	DD-102	PM6DI	6DP-1-102	GP210	6TM-D1
C48	.0047 600V 10%		V84C6D47-10%		PM6D47	6DP-1-472	JL-247	6TM-D47
C49	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C50	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C51	.033 600V		P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C52	68 NPO 5%			DTZ-68	C10Q68C	CM-15-E-680J	CNO-468	10TCC-Q68
C53	68 NPO 5%			DTZ-68	C10Q68C	CM-15-E-680J	CNO-468	10TCC-Q68
C54	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C55	.15 200V		P288N-15		CUB2P22	2DP-3-154	GEM-2015	2TM-P15
C56	.001 600V 10%		V84C6DI-10%	DD-102	PM6DI	6DP-1-102	GP210	6TM-D1
C57	4000 10%		1464-004		1R5D4	CM-20B-392M	MC463	1FM-24
C58	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C59	68 NPO 10%		NPO-DI 68	DTZ-68	C10Q68C	CM-15-E-680J	CNO-468	10TCC-Q68
C60	470 5%		1469-00047	DD-471	5R5T47	CM-19B-471J	MCJ244	MS-347
C61	470 5%		1469-00047	DD-471	5R5T47	CM-19B-471J	MCJ244	MS-347
C62	.0033 600V 10%		V84C6D33-10%		PM6D33	6DP-1-332	JL-233	6TM-D33

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: ARROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C83	.012 500V		P088N-012	DD-393	CUB8E2	6DP-2-223	GEM-6122	67M-S22
C84	.047 500V		P088N-047	DD-503	CUB8E47	6DP-3-473	GEM-6147	67M-S47
C85	.1 500V		P088N-1	DF-104	CUB8P1	6DP-3-104	GEM-601	67M-P1
C86	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C87	.22 400V	Note 2	P088N-22			CUB8P22	6DP-5-224	GEM-6122	67M-P22
C88	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C89	150 5000V 10%	#2268S,Note3					15DP-5-473	GEM-1515	10TM-S47
C90	.047 1000V 10%								
C91	130 5000V N750 10%	Note 4							
C92	130 5000V N750 10%								
C93	100 3000V N750 10%								
C94	.1 600V		P088N-1	DF-104	CUB8P1	6DP-3-104	GEM-601	67M-P1

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1. Not used in Ch. TVP-1.
Note 2. Ch. TVT-1 uses .1mfd @ 500V.
Note 3. Alternate value 180mmf @ 5000V 10% (Part #2364L).
Note 4. Early Production models may use 150mmf @ 5000V.
Packard Bell Part No.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Packard-Bell Part No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch		560T8		C4TB-500K-2	B13-135	PP65A	Power Off-On Note 1
B	Shaft				Not Req.	SK7		
R2A	1000Ω	½	28904A	B-505	A4T-1000-S	Q1-108	U3	Contrast
B	Shaft			Not Req.	F2S1-1/2	Not Req.	Not Req.	
R3A	50K	½	28906A	B-51	A4T-50K-S	Q1-123	U35	Brightness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	2meg	½	25904	B-84	A4T-2meg-S	Q1-140	U59	Vert. Hold
B	Shaft			Not Req.	KSH-3	Not Req.	Not Req.	
R5A	5.5meg	½	26401	AB-90	B4T-5.5meg-S	B11-143	PP61A1	Picture Lock
B	Shaft			Not Req.	TM4	Not Req.	Not Req.	
R6A	1meg	½	26901	AB7-74	A4T7S-1meg	B18-137X	UT-645	Distance-Local (AGC)
	450Vcap							
B	Shaft			AK-19	F2S1-1/2	TM4	Not Req.	
R7A	5meg	½	25907	BX-84	B4T-5meg-S	B11-140	U59	Vert. Lin.
B	Shaft			Not Req.	TM4	Not Req.	Not Req.	
R8A	5meg	½	26410	AB-87	B4T-5meg-S	B11-141	PP61A1	Height
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R9A	25K	½	25902	AB-20	B4T-25K-S	B11-142	TA2S1-	Horiz. Drive
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R10A	1meg	½	26910	AB-87	B4T-1meg-S	B11-141	PP61A1	Focus
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

Note 1. Used in TVP-2 chassis only. Ch. TVP-1 uses 500K Volume with switch (Part #28070).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	4700Ω 1W	
R2	33000 5W	
R3	8.2meg	
R4	8.2meg	
R5	56K	
R6	2.2meg	
R7	120Ω	
R8	33K	0.0Ω †
R9	130K	
R10	56Ω	
R11	12K	(22K) †
R12	470Ω	
R13	100Ω	
R14	5800Ω	
R15	100K	
R16	1000	
R17	6800Ω	
R18	100K	
R19	1300Ω	
R20	2700	
R21	1500Ω	
R22	1800Ω	
R23	470K	
R24	4700Ω 2W	
R25	3900Ω 5W	
R26	470K	
R27	4700Ω 2W	
R28	3900Ω 5W	
R29	470K	
R30	4700Ω 2W	
R31	3900Ω 5W	
R32	470K	
R33	4700Ω 2W	
R34	3900Ω 5W	
R35	120K	
R36	100K 1W	
R37	10meg	
R38	33K	
R39	3300Ω	

ITEM No.	RATING	REMARKS
R40	15K	
R41	100Ω	
R42	39K	
R43	12K	
R44	12K	
R45	100K	(220K) *
R46	100K	(470Ω) *
R47	470K	Note 1
R48	470K	
R49	22000	Note 1
R50	4700 5W	(560Ω) *
R51	10Ω	
R52	10Ω	
R53	39000 10W	Note 1
R54	39K	
R55	150K	
R56	33K	
R57	470K	
R58	2.2meg	
R59	560K	
R60	10K 7W	
R61	10K	
R62	39K	
R63	10K	
R64	2.2meg	
R65	1.5meg	
R66	22K	
R67	68K	
R68	470K	

ITEM No.	RATING	REMARKS
R69	1.5meg	
R70	1meg	
R71	39K	
R72	56K	
R73	130K	
R74	220Ω	
R75	220Ω	
R76	1meg	
R77	1meg	
R78	1500	
R79	470K	
R80	47K	
R81	1300Ω	
R82	6800Ω 1W	
R83	82K	
R84	100Ω	
R85	820K	
R86	820K	
R87	1300 1W	
R88	4700 2W	Note 2
R89	4700 2W	
R90	8200Ω 2W	Note 3
R91	100K	
R92	180Ω	
R93	220K	
R94	470K	
R95	4.7meg	
R96	4700Ω	

† Value used in Models with adjacent channel traps. Note 1. Not used in TVT-1 chassis.
* Alternate value. Note 2. Model 17T1 uses 12K in this application.
Note 3. Not used in TVP-1 chassis.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell Part No.	Gramer Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Rom Part No.	NOTES
L1	1st Video IF	29584A	17-4534	17-4534	TV-131	6236		VF-4
L2	2nd Video IF	29585	17-4533	17-4533	TV-130	6239		VF-3
L3	3rd Video IF	29585	17-4533	17-4533	TV-130	6239		VF-3
L4	4th Video IF	29597A	17-4533	17-4533	TV-130	6239		VF-3
L5	RF Choke	29566	19-1005	19-1005	BC-566	4613		10uh
L6	RF Choke	29566	19-1005	19-1005	BC-566	4613		10uh
L7	Shunt Peaking Coil	29506	19-4181	19-4181	TV-113	6177		VP-5 † 180uh ②
L8	Series Peaking Coil	29553	19-3093	19-3093	TV-118	6177		VP-5 A 82uh ②
L9	4.5MC Trap	29548A	19-2402	19-2402	TV-120	1470		
L10	Series Peaking Coil	29553	19-4400	19-4400	TV-302	6126		400uh ②
L11	Shunt Peaking Coil	29713	19-3800	19-3800	TV-305	6045		800uh
L12	RF Choke	29560	19-1001	19-1001	BC-566	4613		1.3uh
L13	Sound Take-Off Coil	29714	30-1004	30-1004	TV-151	1469		SF-3
L14	Ratio Det.	29594	17-5477	17-5477	TV-132-B	1468BD		
L15	RF Choke	29560	19-1006	19-1005	BC-566	4613		1.3uh

① Used on 29K resistor. † Parallel with 39K resistor.
② Wound on 3500Ω resistor. * Parallel with 3900Ω resistor.
③ Wound on 18K resistor. ● Disregard tap.
* Parallel with 18K resistor.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	* Miller Part No.	Rom Part No.	Thordarson Part No.	NOTES
L16	60Ω		29715A	HS-5	TV-103	6320	H-101	HS-5	Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT 1000 ~(c)	REPLACEMENT DATA: Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	Rom Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.
L17	.320A	40Ω	.9 Hy.	27018				C-2243		C-34X

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	Rom Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.
T1	117V @ 1.5A	540VCT @ .330A	5V ② 3.0A	29584						
			6.3V ② 9.5A							
	SEC. 3	SEC. 4	SEC. 5							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	Rom Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.	NOTES
T2	Vert. Output	29483A	26S24		V310		VO-105	26S24	A-413X	
T3	Vert. Output Yoke-Horiz. (I.T.SMH) (10°)-Vert. (14MH)	29583 ① 29717 ②	Y-53 ③		Y-110 ④		DY-27A ⑤	Y-52 ⑥	Y-60-2 ⑥ YC-110	
	Alt. Yoke	29696 ① ②	Y-52 ③		Y-110 ③		DY-27A ⑤	Y-52 ⑥	Y-60-2 ⑥ YC-110 YC-111 ④	
	3 1/4" Rear Cover & Centering Device	34104 ④							YC-120 ④	
	3 3/4" Rear Cover & Centering Device	34105 ⑤								
	Yoke Clamp	28326 ⑤								
T4	Horiz. Output	29503								
	Alt. Horiz. Output	29499A ①								

① Used in Power Ch. TVP-1.
② Original rear cover size may be either 3 1/4" or 3 3/4", depending on yoke manufacturer.
③ When 3 1/4" rear cover is used, a new rear cover, centering device, and yoke clamping device are required.
④ Includes yoke clamp.
⑤ Does not include yoke clamp.
⑥ Required when 3 3/4" rear cover is used.
* Used in early production of some chassis TVP-1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: Packard-Bell Part No.	Halldorson Part No.	Merit Part No.	Rom Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.	NOTES
T5	15500Ω	3.4Ω	29492A	22S83	A-2935	AU-609	A-3870	22S98	S-5S2	Used in Ch. TVT-2
	CT		29493D	24S91	A-2930	AU-607	A-3877	24S81	S-3X	Used in Ch. TVT-1

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: Packard-Bell Part No.	REPLACEMENT DATA: QUAM Part No.	NOTES
SP1	10"	PM	6-8Ω	837ILC	10AEA27.4	Model 2IK2
SP2	4"	PM	6-8Ω	83111	4A0727.4	Model 2IK2
SP3	4"	PM	6-8Ω	83110A	4AL26.2	Model 2IK2
	4" x 6"	PM	3-4Ω	83132		Models 17T1, 21T2
	6" x 9"	PM	3-4Ω	83112		Model 21C3

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell Part No	REPLACEMENT DATA	NOTES
K1	Ratio Detector Network	300mmf, 300mmf, 300mmf, 1000mmf, 1000 (1000Ω, 1900Ω, 6800Ω, 8800Ω, 68K	23627A	Aerovox Centralab	PA-954 PC-342

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell Part No.	NOTES
M1	Tuner	10640A	VHF, Standard Coil Type GG-4390A
	Tuner	10631A	VHF with UHF provisions
	Tuner	10630A	UHF
M2	Switch	29512	Wafer (Computer Dial Lights)
M3	Circuit Breaker	8671SA	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	5513C	
Safety Glass	5509DA	
Knob	5324AD	Channel Selector
Knob	5329DC	Fine Tuning
Knob	5329DA	Brightness, Contrast, Vert. Hold, Off-On
Knob	5325DA	Local-Distance
Dial Glass	5513T	Computer Dial

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8735 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Asterisk Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8235
300Ω Antenna Lead-In	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8454 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

FM-AM TUNER PARTS LIST AND DESCRIPTIONS

TUBES

+ CBS +	GENERAL ELECTRIC	+ RAYTHEON +	SYLVANIA +

ITEM No.	USE	TYPE
V18	FM RF Amp	6BA6
V19	FM Mixer-Osc.	12AT7
V20	FM AFC-AF Amp.	7025 (12AX7) *
V21	AM Converter	6BE6

ITEM No.	USE	TYPE
V22	FM-AM IF Amp	6BA6
V23	AM Det.-FM Limiter	6AU6
V24	Stereo Preamp.-AF Amp.	7025

* Alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: Packard-Bell Part No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C75	2	350	24185	PRR705	BR345	TC595	TD-2-450	TVA-1701	
C76	50	50	24154	BR50V5	NLW5-50	TT505	MLS-50	TE-1505	Note 1

Note 1. Some versions may use 10mfd in this application.

FIXED CAPACITORS

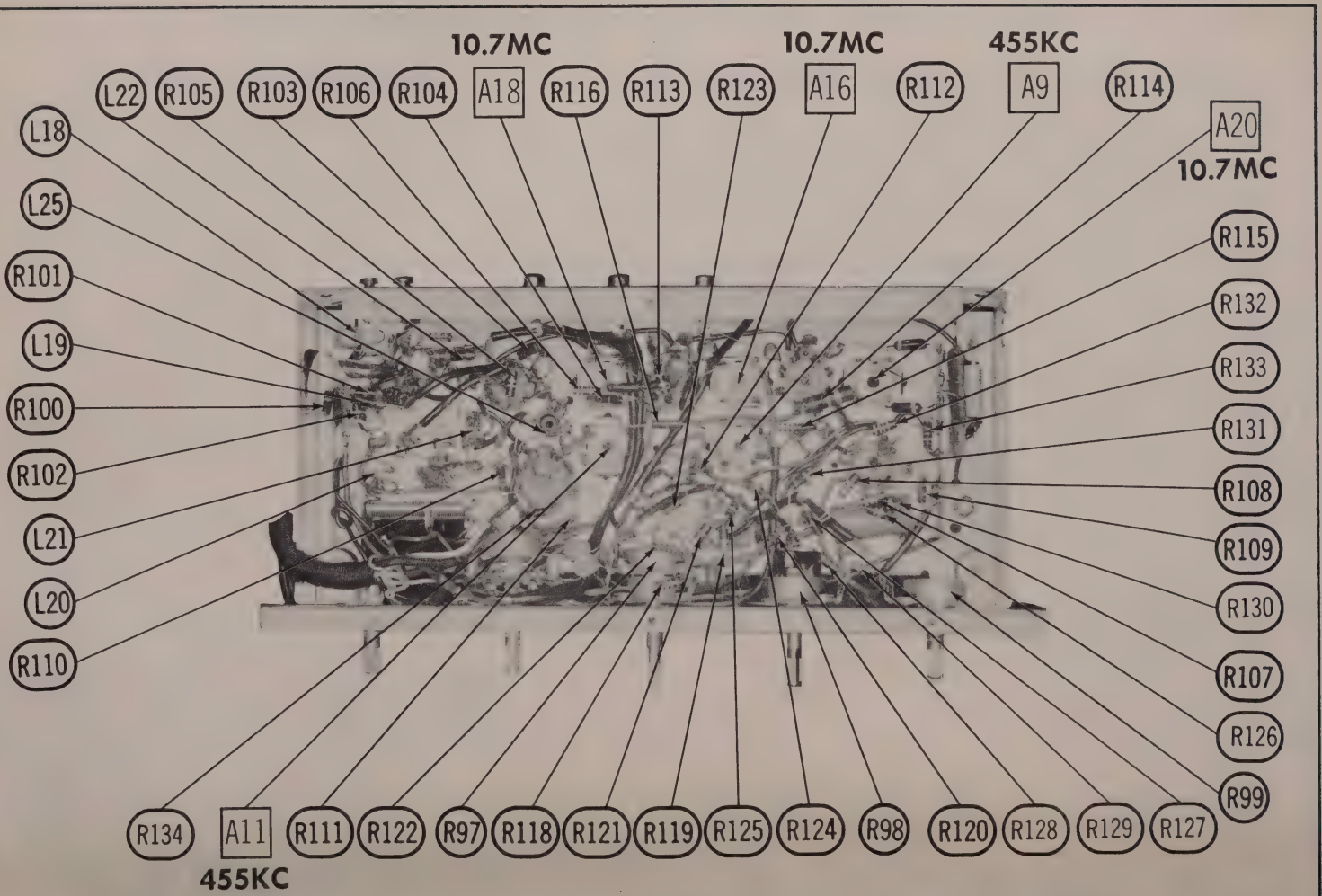
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C77	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C78	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C79	100		BPD-001		DD-102	BYA10S0	CCD-102	GP20	54K-S10
C80	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C81	47		DE-47		DD-470	L20J47	CCD-470	GP447	10TS-Q47
C82	1000		BPD-001		DD-102	BYA10S1	CCD-102	GP20	10TC-Y15
C83	1.5 10%		TCZ-1R5			CW19C	CWH-1R5		
C84	1.5-10 MPO	#2340							
C85	68 NPO 5%	#2329S	DTZ-68		CD6C68C	CM-15-E-680J	CMO-468		10TCC-Q68
C86	10 N330 10%		TCA-10						10TCH-Q10
C87	47		DE-47		DD-470	L20J47	CCD-470	GP447	10TS-Q47
C88	1000		BPD-001		DD-102	BYA10S0	CCD-102	GP20	54K-D10
C89	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C90	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C91	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C92	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C93	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C94	1.5 10%		VPO-1R1 5		CU15C	CW15C	CWO-1R5		10TCC-Y15
C95	5000		DF-05		DD-503	CUB5E5	6DP-3-502	GP150	54K-S50
C96	47		BPD-470		DD-470	L20Q47	CCD-470	GP447	10TS-Q47
C97	100	(10000mmf)*	BPD-001		DD-102	BYA10S1	CCD-102	GP20	54K-D10
C98	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C99	100		BPD-001		DD-102	BYA10S0	CCD-102	GP20	54K-S10
C100	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C101	10000		BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C102	220		BPD-00022		DD-22	L20T22	CCD-22	GP322	10TS-T22
C103	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C104	1000		BPD-001		DD-102	BYA10S0	CCD-102	GP20	54K-D10
C105	10000	Note 1	BPD-01		DD-103	BYA10S1	CCD-103	GP110	54K-S10
C106	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C107	.022 200V		P288N-022		DD-203	CUB4S22	4DP-2-333	GEM-4122	27M-S22
C108	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C109	220		BPD-00022		DD-22	L20T22	CCD-22	GP322	10TS-T22
C110	5000		BPD-005		DD-503	BYA10S6	CCD-503	GP250	54K-D50
C111	5000		BPD-005		DD-503	BYA10S6	CCD-503	GP250	54K-D50
C112	50000		BPD-05		DD-503	CUB5E5	6DP-3-503	GP150	54K-S50
C113	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C114	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C115	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C116	10000		BPD-01		DD-103	BYA10S8	CCD-103	GP110	54K-S10
C117	5mfd 100V	Note 2	P283E-1.0			MPF1V		GEM-2	5EP050282

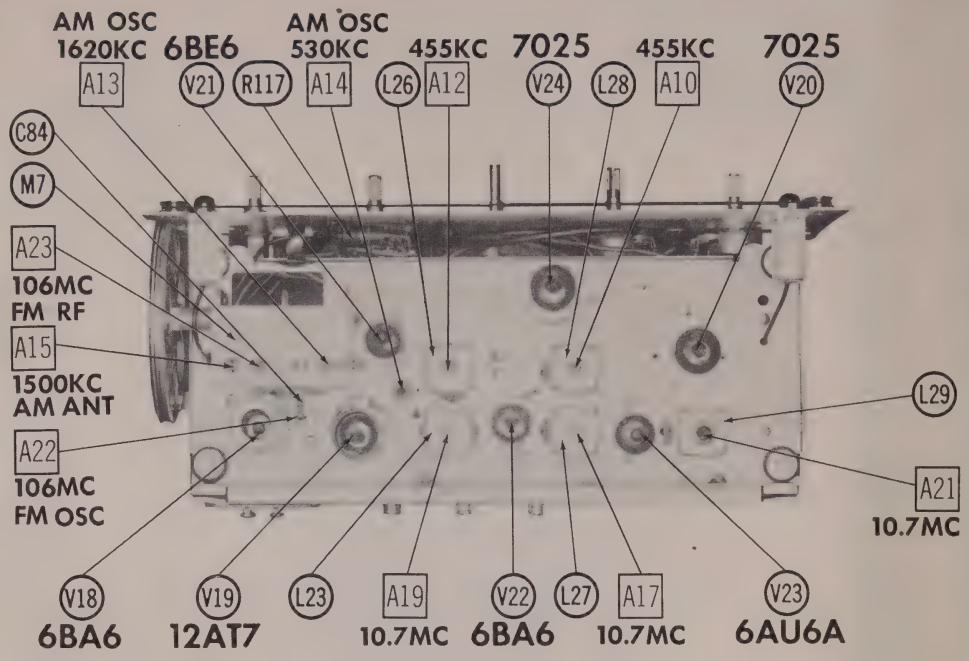
Note 1. Not used in some versions. # Packard-Bell Part No.
Note 2. Not used in Ch. TVT-1. † Alternate value.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

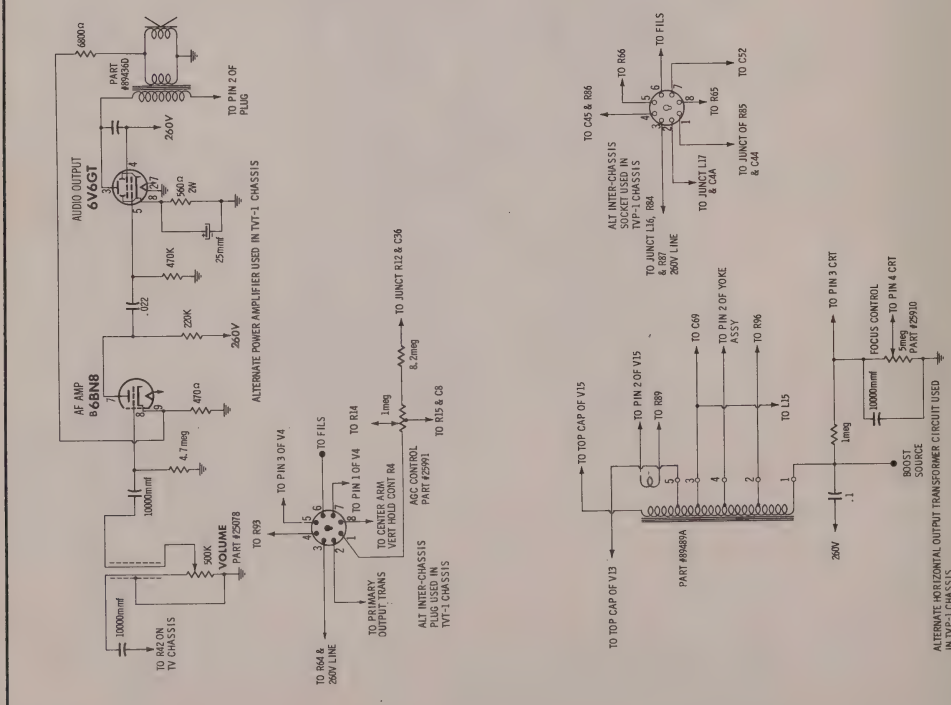
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Packard-Bell Part No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R97A	1meg	½	25080					Loudness
B	75K tap							
	1meg							Balance
R98A	500K	½	25081			B13-135	PP65A	Bass
B	Shaft					SK7		
C	Switch					Not Req.	Not Req.	Push-Pull AFC Switch
R99A	500K	½	25576	B-59	A4T-500K-S	Q1-133	U50	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	



FM-AM TUNER CHASSIS 7TU-3 BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



FM-AM TUNER CHASSIS 7TU-3 - TOP VIEW


ALTERNATE CIRCUITS
AUDIO OUTPUT 6V6GT
AF AMP 6BN8
ALTERNATE POWER AMPLIFIER USED IN TVT-1 CHASSIS
VOLUME PART #25078
TO PIN 2 OF PLUG
TO PIN 3 OF V4
TO PIN 1 OF V4
TO R14
TO CENTER ARM VERT HOLD CONT R4
AGC CONTROL PART #25941
TO JUNCT R12 & C36
TO R15 & C8
ALT INTER-CHASSIS PLUG USED IN TVT-1 CHASSIS
TO PRIMARY OUTPUT TRANS
TO R93
TO R64 & 260V LINE
TO FILS
TO R82 ON TV CHASSIS
TO C45 & R86
TO R66
TO C52
TO R65
TO JUNCT OF R85 & C44
ALT INTER-CHASSIS SOCKET USED IN TVP-1 CHASSIS
TO JUNCT L16, R84 & R81 260V LINE
TO JUNCT L17 & C4A
TO TOP CAP OF V15
TO PIN 2 OF V15
TO R89
TO C69
TO PIN 2 OF YOKE ASSY
TO R96
TO L15
TO TOP CAP OF V13
PART #89489A
TO PIN 3 CRT
FOCUS CONTROL
TO PIN 4 CRT
PART #2910
BOOST SOURCE
ALTERNATE HORIZONTAL OUTPUT TRANSFORMER CIRCUIT USED IN TVP-1 CHASSIS

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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TUNER ALIGNMENT INSTRUCTIONS
10639A

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213, A214, A215..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

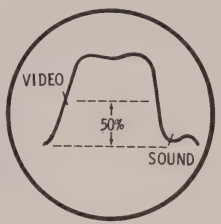


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (D). Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Restore bias.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by compressing or expanding coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

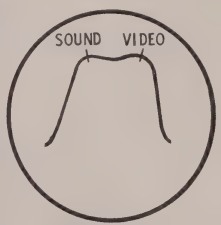


FIG. 202

TUNER ALIGNMENT INSTRUCTIONS

10640A

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A201, A202 and A203.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A204 thru A215.....GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

FIG. 201

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

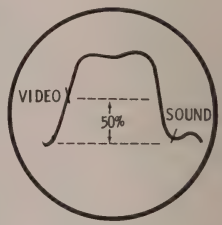
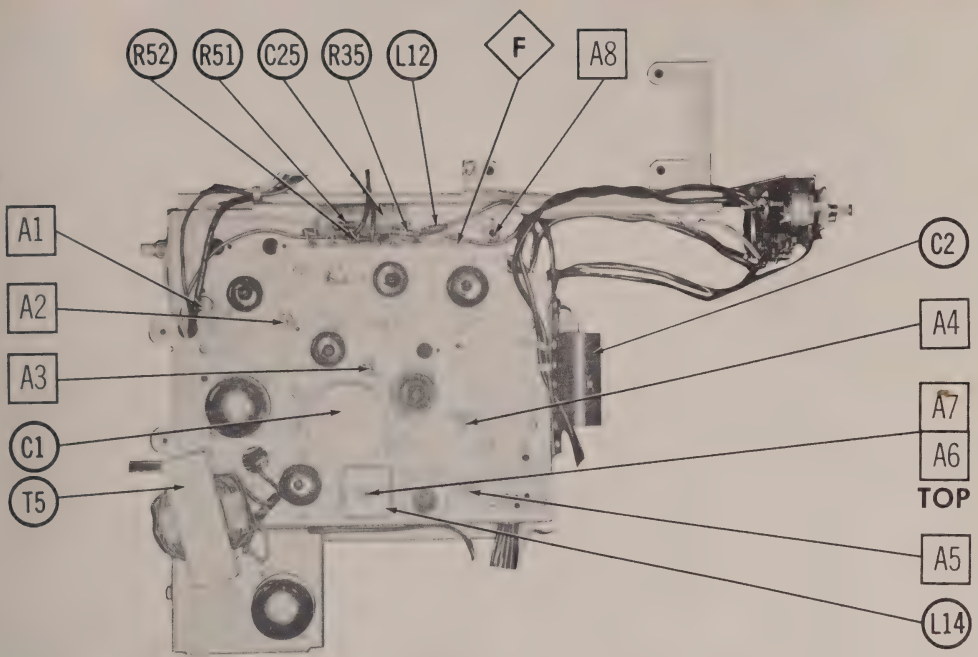
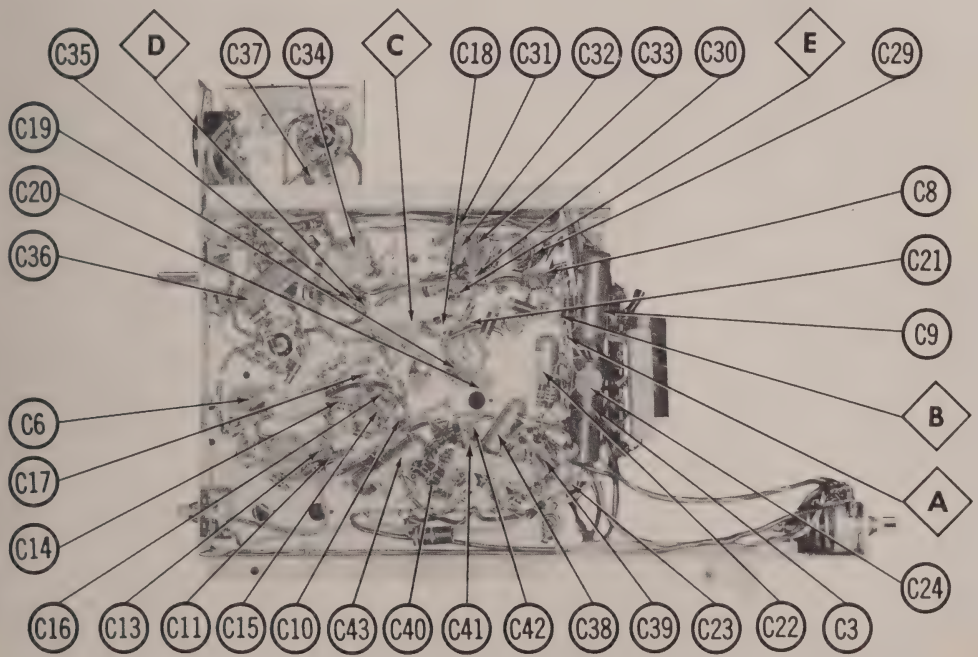


FIG. 202



TUNER CHASSIS TVT-2 - TOP VIEW



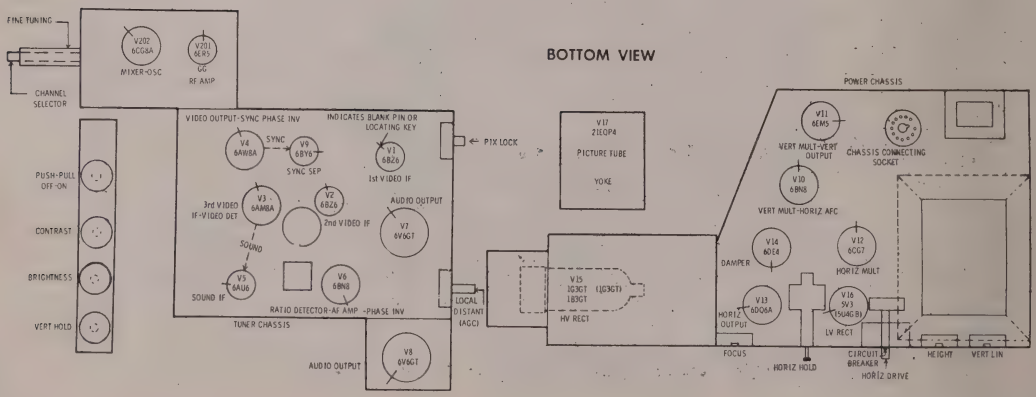
TUNER CHASSIS TVT-2 - BOTTOM VIEW - CAPACITOR IDENT.

RESISTANCE MEASUREMENTS

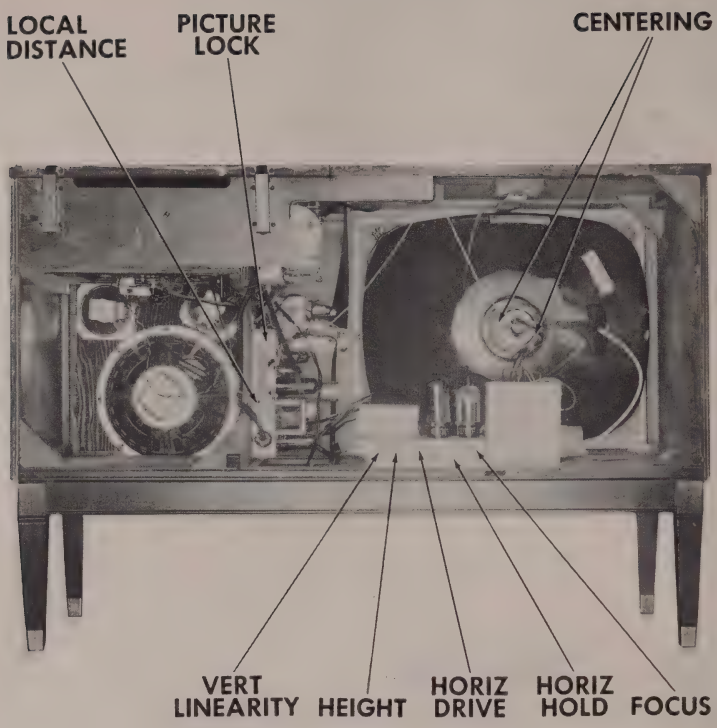
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	2.2meg	56Ω	0Ω	.1Ω	▲470Ω	▲470Ω	0Ω		
V2	6BZ6	60K	▲100Ω	0Ω	.1Ω	†510Ω	†510Ω	65K		
V3	6AM8A	270Ω	.1Ω	†4900Ω	0Ω	.1Ω	†4900Ω	.1Ω	3300Ω	0Ω
V4	6AW8A	10K	†560K	†39K	0Ω	.1Ω	● 270Ω	470K	†3900Ω	†4700Ω
V5	6AU6	1.2Ω	0Ω	.1Ω	0Ω	†7200Ω	†22K	120Ω		
V6	6BN8	INF	24K	INF	.1Ω	0Ω	0Ω	†100K	†820K	100K
V7	6V6GT	TP	0Ω	†140Ω	†2200Ω	470K	NC	.1Ω	470Ω	
V8	6V6GT	NC	0Ω	†140Ω	†2200Ω	470K	TP	.1Ω	470Ω	
V9	6BY6	150K	0Ω	0Ω	.1Ω	†560K	†12K	2.2meg		
V10	6BN8	2meg	1meg	1meg	0Ω	.1Ω	560Ω	●†5meg	● 1.4meg	0Ω
V11	6EM5	†470Ω	TP	● 3meg	.1Ω	0Ω	● 3meg	0Ω	NC	†860Ω
V12	6CG7	†6800Ω	2.5meg	1200Ω	.1Ω	0Ω	†100K	82K	1200Ω	0Ω
V13	6DQ6A	TP	.1Ω	TP	†6800Ω	650K	TP	0Ω	0Ω	TOP CAP †15Ω
V14	6DE4	NC	TP	¶4meg	NC	†40Ω	TP	0Ω	.1Ω	
V15	1G3GT/ 1B3GT	PINS 1 thru 8 HAVE INFINITE RESISTANCE								TOP CAP †325Ω
V16	5V3	NC	¶	NC	19Ω	NC	17Ω	NC	¶	
V17	21EQP4	0Ω	39K	†1meg	● †1.2meg	NC	NC	● 130K	.1Ω	
V201	6ER5/ GG	0Ω	● 2.7meg	0Ω	.1Ω	†4300Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†8600Ω	0Ω	0Ω	.1Ω	†4300Ω	†3900Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 270V SOURCE.
† MEASURED FROM PIN 3 OF V14.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the Horizontal Drive control (R9) until white lines disappear.

If the Horizontal Drive was adjusted, check horizontal sync by switching off channel and back again.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL FOR MODEL 21K2

(Power Ch. TVP-2)

1. Remove 6 push-on type knobs from the front of the cabinet and 1 knob from the rear.
2. Remove 8 wood screws and 1 metal screw holding rear cover. Remove antenna leads. Remove rear cover.
3. Remove HV lead, picture tube socket, yoke clamp, picture tube coating grounding spring, phono motor plug, and 2 plugs from tuner chassis to power chassis.
4. Remove lead from tuner chassis to picture tube socket.
5. Remove 2 chassis bolts holding power chassis.
6. Remove power chassis.

(Tuner Ch. TVT-2)

1. Remove FM-AM tuner chassis power plug and speaker plug from tuner chassis.
2. Remove 1 metal screw above tuner chassis and 1 metal screw holding control bracket.
3. Slide tuner chassis partially out, then unplug computer dial from its plastic case.
4. Remove tuner chassis.

(FM-AM Tuner Ch. 7TU-3)

1. Remove 4 screws holding pressed wood panel on inside front of record changer compartment.
2. Remove 6 wood screws holding the FM-AM tuner control trim.
3. Remove phono pickup plugs and compartment lamp plug.
4. Lift FM-AM tuner chassis out of record changer compartment.

PICTURE TUBE REMOVAL

1. Remove power chassis.
2. Remove 2 bolts holding picture tube mounting bracket at bottom of cabinet and 1 bolt at top.
3. Remove screw holding picture tube bracket ground wire.
4. Remove picture tube assembly.

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 236**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 399

RCA Victor Models 21CD8725, U, 21CD8727, U, 21CD8775, U, 21CD8776, U, 21CD8777, U, 21CD8865, U, 21CD8866, U, 21CD8867, U, 21CD8885, U, 21CD8886, U, 21CD8888, U, 21CD8906, U, 21CD8907, U, 21CD8926, U, 21CD8927, U, 21CD8949, U (Ch. CTC7A, B, C, D, E, F) were covered in PHOTOFACT Folder 3 - Set 399.

Models 21CF8960, U and 21CF8965, U (Ch. CTC7N, P, CTP5A) are electrically identical to the models covered except for the following changes.

AUDIO CIRCUIT CHANGED

A separate audio amplifier chassis is used in Ch. CTC7N, P. When this separate amplifier chassis is used, V8 (Audio Output) is changed to a voltage regulator circuit. Partial schematics showing the voltage regulator circuit and the audio amplifier circuit is given in this bulletin.

COMPONENT CHANGES

R52 is omitted.

L15 is omitted.

A 1000mmf @ 500V ceramic capacitor is added from the junction of R41 and the 280 voltage source to ground.

R133 is decreased from 22meg to 10meg.

R3B is now a single control as R3A (Tone) is a part of the separate amplifier chassis. The new part number for the height control is #105877.

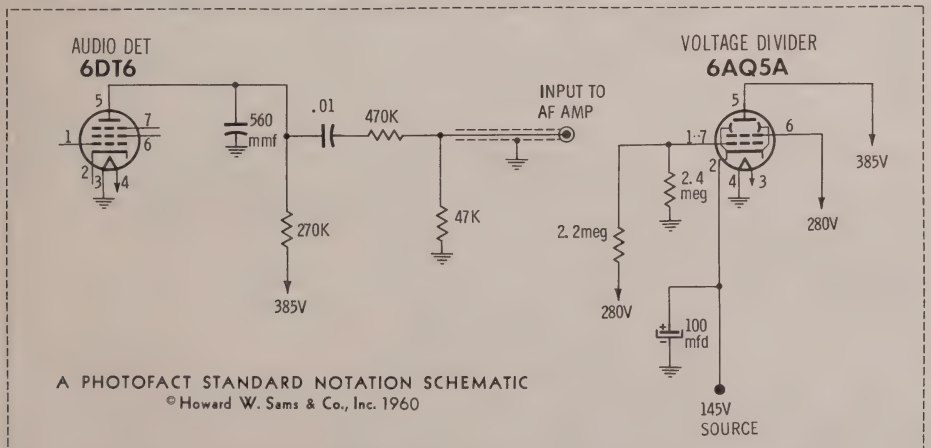
AC INPUT CIRCUIT REVISED

The AC Input Circuit has been revised in order to use the separate audio amplifier chassis. A partial schematic showing the new circuit is given in this bulletin.

RCA VICTOR MODELS 21CF8960, U, 21CF8965, U (CH. CTC7N, P, CTP5A)

PRODUCTION CHANGE
BULLETIN 236

PRODUCTION CHANGE
BULLETIN 236



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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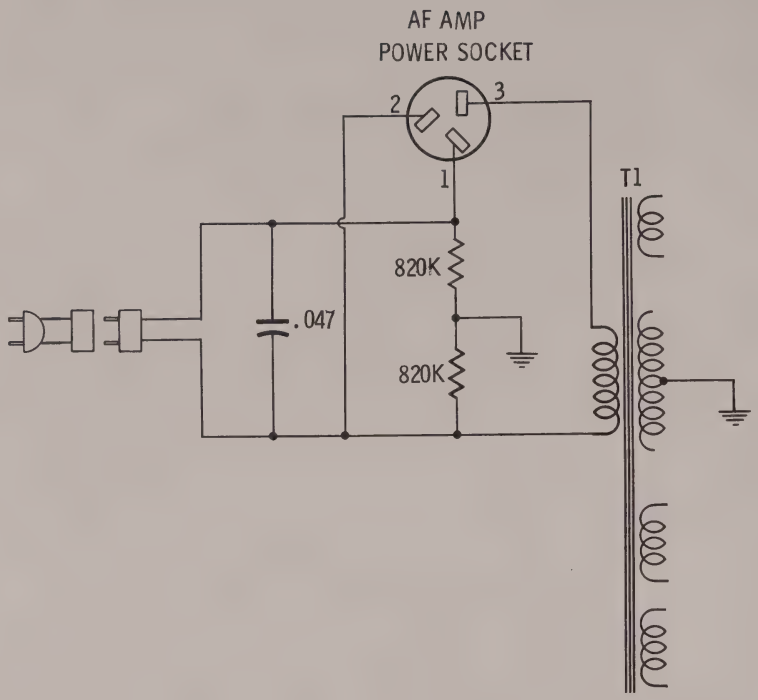
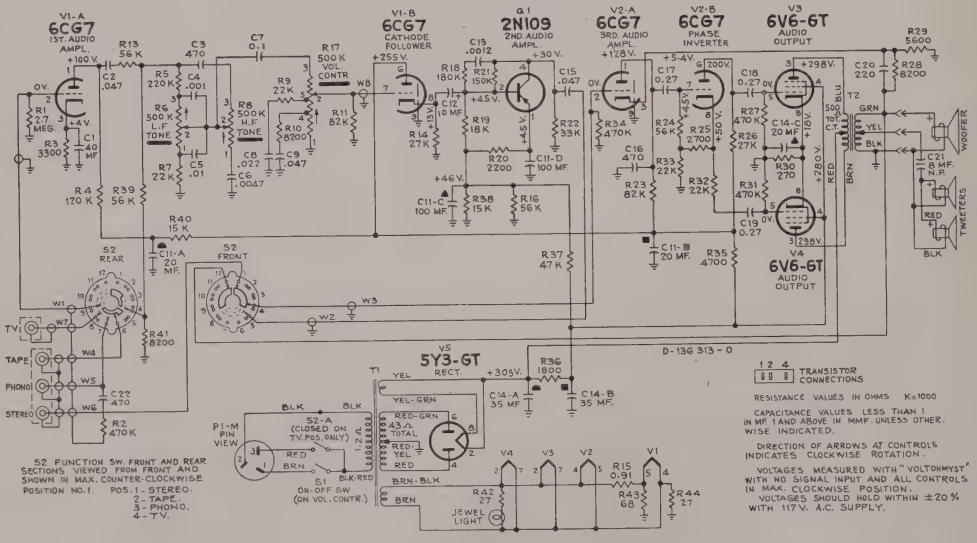
SET 482 FOLDER 3





CTP5A AUDIO AMPLIFIER

Schematic Diagram Courtesy of Radio Corporation of America

Emerson Models 1466, 1467, 1470, 1471 (Ch. 120434N, W, 120435P, Y, 120445W, 120446Y) were covered in PHOTOFACT Folder 2 - Set 420.

Models 1416, 1417, 1436, 1437, 1444, 1445, 1468, 1469, 1474, 1475, 1476, 1477, 1478, 1479 (Ch. 120434N, W, 120435P, Y, 120460) are added, along with late production changes, with the publication of this bulletin.

The following changes apply to printed board chassis coded (E).

TO IMPROVE VIDEO RESPONSE

A 750uh peaking coil (Part #708357) is added from R36 to ground.

R47 is increased from 1.5meg to 2.2meg.

A 3.3meg $\frac{1}{2}$ watt resistor is added in parallel with C24.

R32 is decreased from 82Ω to 47Ω.

R33 is increased from 6800Ω to 8200Ω.

C29 is decreased from 75mmf to 33mmf.

C28 is increased from 4700mmf to 10000mmf.

TO IMPROVE HORIZONTAL SWEEP

R77 is decreased from 1meg to 680K.

The following change applies to printed circuit board chassis coded (G).

TO IMPROVE SOUND

R44 is decreased from 560Ω to 470Ω.

The following change applies to power chassis coded (A).

TO REDUCE SNIVETS

A 1000mmf @ 1000V ceramic disc capacitor is added from pin 1 of T4 to ground.

The following change applies to power chassis coded (B).

TO INCREASE WIDTH

The jumper wire across R80 is omitted. A 3300Ω $\frac{1}{2}$ watt resistor is then wired in parallel with R80.

COMPONENT CHANGE

T1, power transformer, is changed to Part #730085. When this part number is used, 2 fusible links, $2\frac{1}{2}$" long, cut from #26 bare wire, should be used. The part number for this wire is #580308.

Models 1416, 1417, 1468, 1469, 1478, 1479 use two PM Speakers, 6" (Phased), Part #180171.

Models 1476, 1477 use one 6" PM Speaker, Part #180170, and one $3\frac{1}{2}$" PM Speaker, Part #180189.

The following changes apply to power chassis coded (C).

TO IMPROVE HORIZONTAL SWEEP

T4, Horizontal Output Transformer, is changed to Part #738162.

R83 is omitted and replaced by direct wiring.

R80 is omitted and replaced by direct wiring.

C68 is omitted and replaced by direct wiring.

C72 is increased in voltage rating from 600V to 1000V.

C65 is decreased from .1mfd to .033mfd.

The following change applies to power chassis coded (C) 1

K1 is changed to Part #923057X. Since Part #923057X does not have a 10000mmf capacitor included, it is necessary to add this capacitor from terminal 2 of K1 to ground.

The following change applies to printed circuit board chassis coded (H).

R1, Volume and Switch, is changed to Part #930487.

The following change applies to printed circuit board coded (H) for Ch. 120424W, 120425Y and (J) for Ch. 120434N, 120435P.

A 2.2meg $\frac{1}{2}$ watt resistor is added from pin 7 of V10, Horiz. Mult., to ground.

AM TUNER AND STEREO AMP ADDED

Models 1444, 1445, 1474, 1475 use a AM Tuner & Stereo Amp. Ch. 120460. A schematic showing this tuner and amp is given in this bulletin.

COMPONENT CHANGES

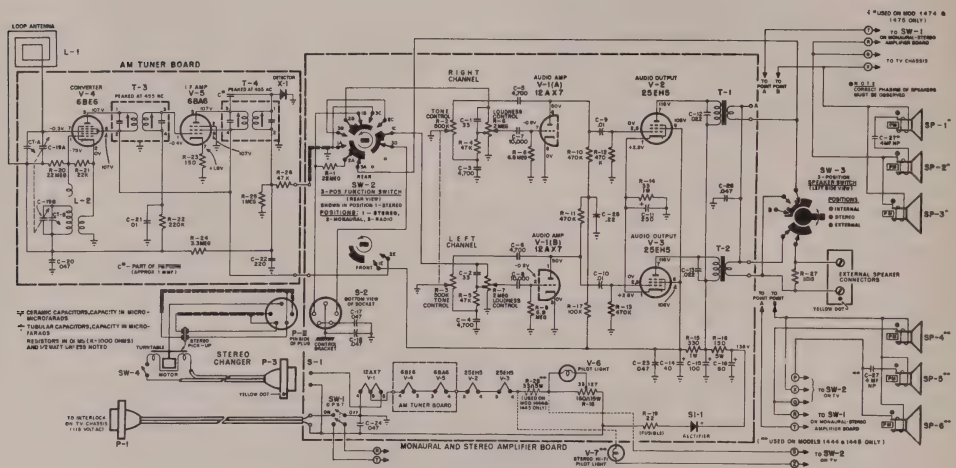
Models 1436, 1437 use one 6" PM Speaker (Part #180171A) and one 4" PM Speaker (Part #180199).

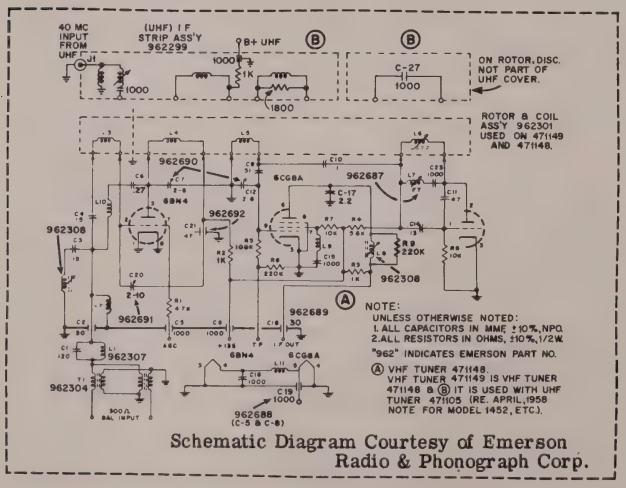
Models 1444, 1445 use one 8" PM Speaker (Part #180165A, one 4" x 6" oval PM Speaker (Part #180200, and one 3½" PM Speaker (Part #180201.

Models 1474, 1475 use one 8" PM Speaker (Part #180165A) and two 3½" PM Speakers (Part #180164A).

NEW VHF TUNER ADDED

Models 1436, 1444, 1474 use VHF Tuner #471148. Models 1437, 1445, 1475 use VHF Tuner #471149. A schematic showing the new tuners is given in this bulletin.



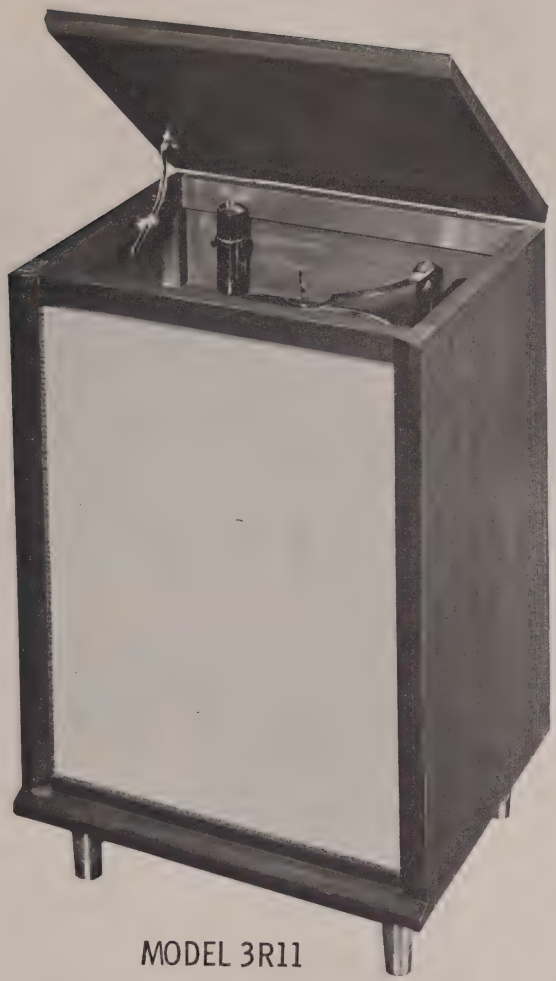

40 MC INPUT FROM UHF
(UHF) I F STRIP ASS'Y 962299
B+ UHF
ON ROTOR, DISC. NOT PART OF UHF COVER.
ROTOR & COIL ASSY 962301 USED ON 471149 AND 471148.
962690
962687
962692
962308
962691
962689
962307
962304
962688 (C-5 & C-8)
NOTE:
UNLESS OTHERWISE NOTED:
1. ALL CAPACITORS IN MMF ±10%, NPO.
2. ALL RESISTORS IN OHMS, ±10%, 1/2 W.
"962" INDICATES EMERSON PART NO.
Ⓐ VHF TUNER 471148. VHF TUNER 471149 IS VHF TUNER 471148 Ⓑ IT IS USED WITH UHF TUNER 471105 (RE. APRIL, 1958 NOTE FOR MODEL 1452, ETC.).

Schematic Diagram Courtesy of Emerson Radio & Phonograph Corp.

PHOTOFACT® Folder

ADMIRAL MODELS 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)

ADMIRAL MODELS 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)



MODEL 3R11

ADMIRAL MODELS 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)

TRADE NAME	Admiral Models 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland Street, Chicago 47, Illinois
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 40 Watts, .38 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER RC668-18P — SEE ADMIRAL R647-2D — PHOTOFACT SET 398 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT664

DATE 4-60 SET 482 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel Preamp.	12AX7	V2 V3	Left Channel Output Rectifier	EL84/6BQ5 5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	70	300	67B23-9	PR4-295		WT407		TVAS-3561 *	
B	50	300							
C	30	250							
C2	20	250	67B4-41	PRS1570	BR2025	TC55	TD-20-250	TVA-1508	
C3	10	6	67B35-7	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C4	50	25	67A4-31 ①	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	

① Alternate Part Number 67B4-31.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	35		NPO-SI 36	TCZ-36	CJ0Q36C	CCTO-350	GP439	10TS-Q39
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C9	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C10	10000 1500V		DAC-27	DD16-103	HVE16S1	16DP-3-103	2HV-110	BL-S10
C11	68		SI 68	D6-680	L10Q68	CCD-680	GP468	10TS-Q68
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C13	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C14	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C15	4mfd 10V	#64B13-5	P123ZN-4.0					118P40502S2
C16	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

Admiral Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3meg *	1/2	75B46-3				FA36T95	Loudness, Left Channel
B	3meg *	1/2					RU36T16	Loudness, Right Channel
C	Shaft						CS3500	
R2A	500K	1/2	75D1-119	B-59	A47-500K-S	Q11-133	U50	Tone, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Tap@1meg.

RESISTORS

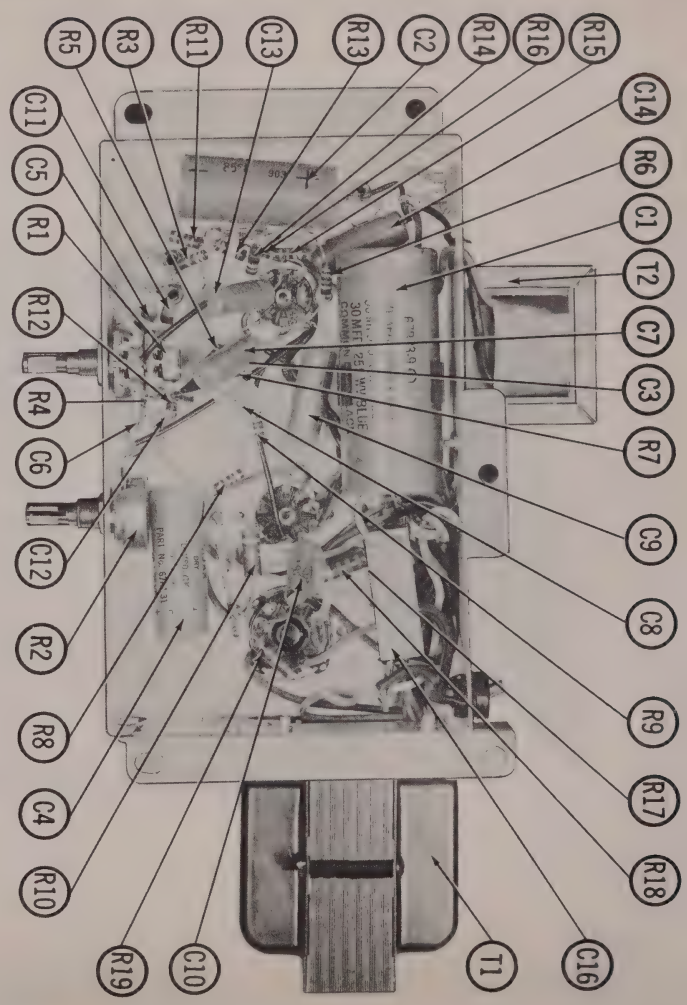
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	3.3meg	
R4	100K	
R5	3.3meg	
R6	470K	
R7	4700Ω	
R8	470K	

ITEM No.	RATING	REMARKS
R9	3.3meg	
R10	130Ω 5% 1W	
R11	3.3meg	
R12	100K	
R13	3.3meg	
R14	100K	

ITEM No.	RATING	REMARKS
R15	15K	
R16	1800Ω	
R17	47K	
R18	2200Ω 1W	
R19	100Ω 1W	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .38A	500 VCT @.050A	5V@ 2A	80B60-4	24R09U			PC8403	24R09U	R-8A
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT @1.06A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6500Ω	3-4Ω	79D33-23	26S49	A-3019	AU-604	A-8092	26S49	S-5Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	78C151-3	8A31	
SP2	3½"	PM	3-4Ω	78C148-1	4A1TZ4.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ADMIRAL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	409C34-1	13TB	Not Req.	26S	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS	
	ADMIRAL PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M2	98C95-1	W-103STS † or W-103STDS †♦	S-69X † or S-69XSD †♦ or S-69XDD ♦	† Jewel	♦ Diamond

MISCELLANEOUS

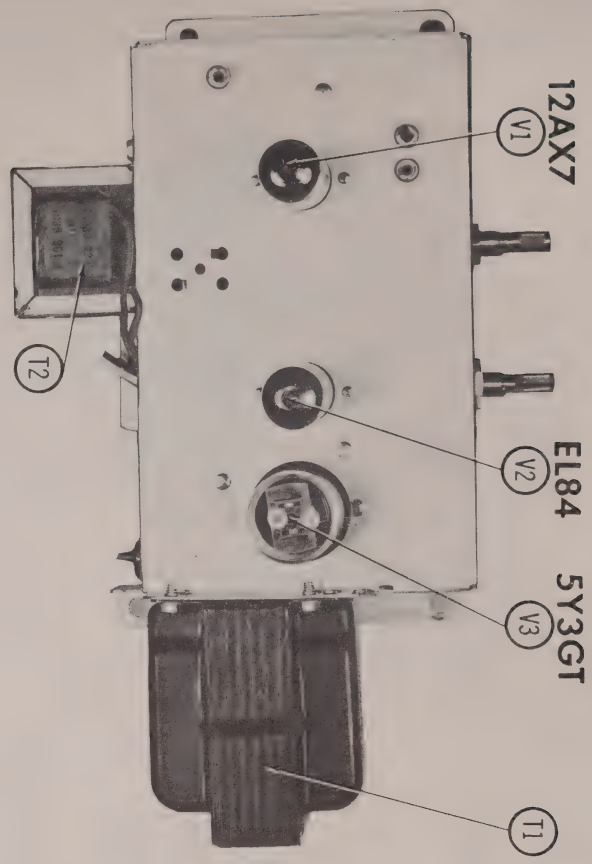
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Switch	408A-1	Off-On Reject
M4	Motor	407C-28	Turntable Drive

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33C254-16	Loudness, Tone
Knob	403D86-4	Speed Selector
Cabinet	35E523-1	Model 3R11
Cabinet	35E523-2	Model 3R12
Cabinet	35E523-3	Model 3R13
Cabinet	35E523-4	Model 3R14
Cabinet Leg	37D168-57	Model 3R11
Cabinet Leg	37D168-52	Model 3R12
Cabinet Leg	37D168-53	Model 3R13
Cabinet Leg	37D168-55	Model 3R14

CHASSIS—TOP VIEW

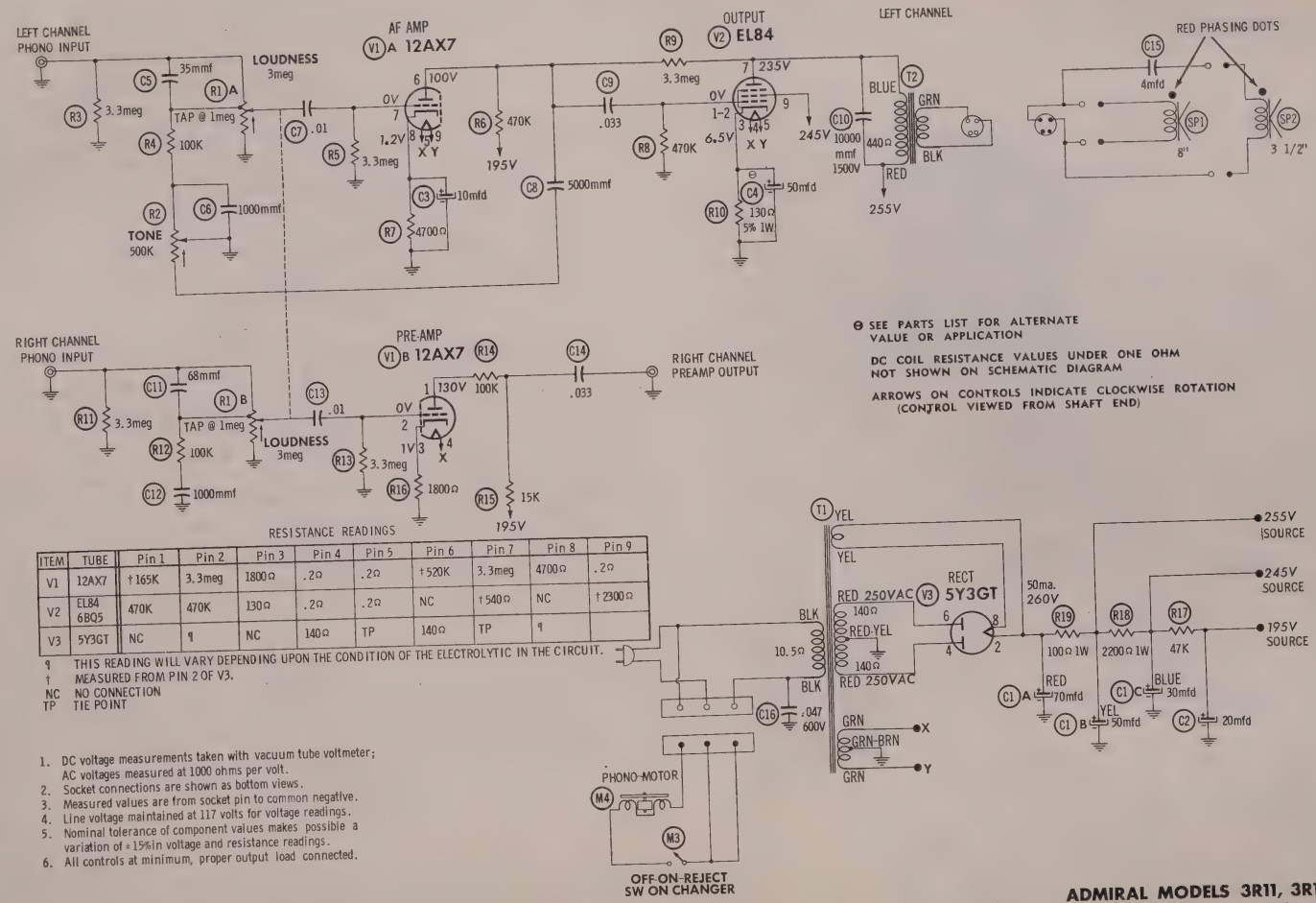


WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

ADMIRAL MODELS 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)

FOLDER 4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†165K	3.3meg	1800Ω	.2Ω	.2Ω	†520K	3.3meg	4700Ω	.2Ω
V2	EL84 6BQ5	470K	470K	130Ω	.2Ω	.2Ω	NC	†540Ω	NC	†2300Ω
V3	5Y3GT	NC	¶	NC	140Ω	TP	140Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V3.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ADMIRAL MODELS 3R11, 3R12, 3R13, 3R14 (Ch. 3R1)

PHOTOFACT® Folder

AUTOMATIC MODELS C-12, R-54, R-54B

AUTOMATIC MODELS
C-12, R-54, R-54B

MODEL R-54B

AUTOMATIC MODELS
C-12, R-54, R-54B

TRADE NAME	Automatic Models C-12, R-54, R-54B
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Battery Operated 6 Tube Universal Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
RATING	3 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	538 — 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	Antenna receptacle thru dummy (Fig. 1).	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

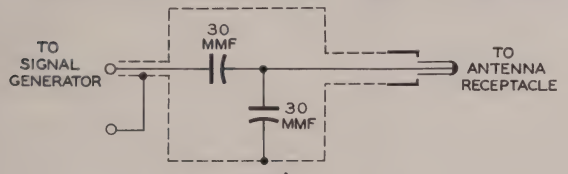
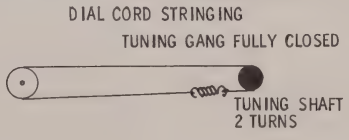


FIG. 1



REAR VIEW

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JD698

SET 482 FOLDER 5

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BA6 ①	V4	AF Amp. -Det. -AVC	12AV6 (12AT6) *
V2	Converter	12BE6 ①	V5	Output	12AQ5 ①
V3	IF Amplifier	12BA6 ①	V6	Rectifier	12X4 ①

* Alternate.
① Equivalent type 6 volt tubes used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	350	20-86 ①	AFH3-107	CO800	FP329.5	TMT-92	TVL-3635	
B	■20	350							
C	20	25							

① Part Number CE-86 is used in Models R-54, C-12.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#28-800						
C3	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C4	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	12	Note 1	DI-12	DD-120	L10Q12	CCD-120	GP412	10TS-Q12
C7A								
B		#28-4046						
C	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C8	100 N750	Note 2	N750-DI 100	N750-100	C10T1U	CCTN-100	CN7-310	10TCU-T10
C9	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C10	.02 1000V	Note 3	P1088N-02		CUB10S2	16DP-4-203	GEM-1012	10TM-S2
C11	.25 100V		P288N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P25
C12	.47 100V	Note 4	P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C13	.47 100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47

\# Automatic Part Number.
Note 1. Models R-54 & C12 use 5mmf in this application.
Note 2. Models R-54 & C12 use 270mmf in this application.
Note 3. Some versions may use .007mfd in this application.
Note 4. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	80-57D ①	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

Note 1: Models C-12 and R-54 use Part #RV-57C.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

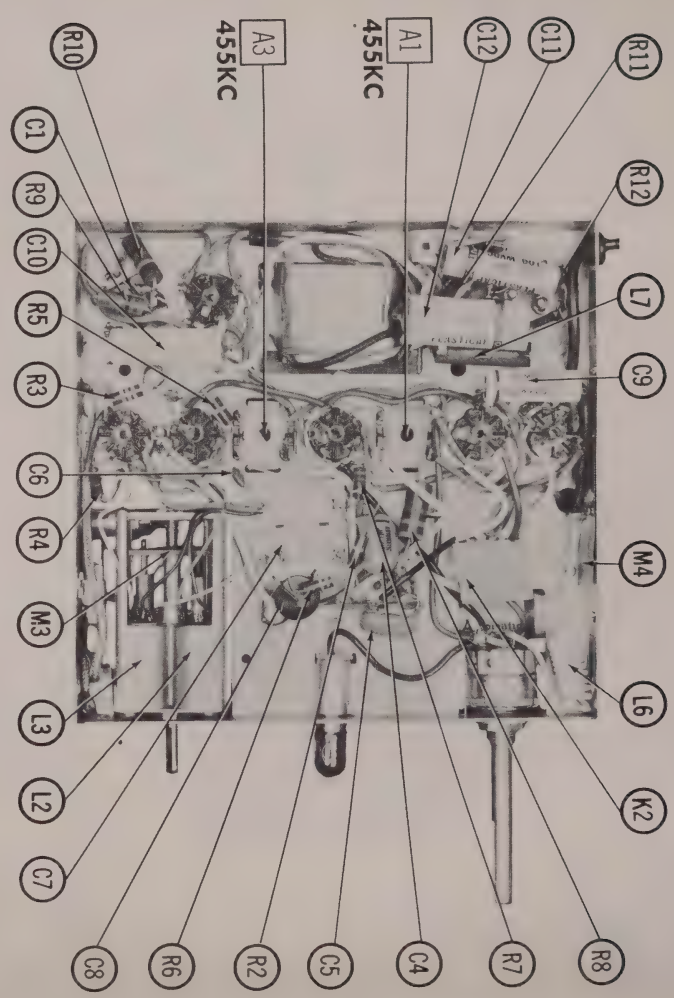
ITEM No.	RATING	REMARKS
R2	2.2meg	
R3	470K	
R4	150Ω	(220Ω) *
R5	150K	

ITEM No.	RATING	REMARKS
R6	47K	
R7	1500Ω	(820Ω) *
R8	6800Ω 2W	
R9	1000Ω 1W	

ITEM No.	RATING	REMARKS
R10	270Ω 1W	Note 1
R11	220Ω 1W	Note 2
R12	220Ω 1W	Note 2

* Alternate.
Note 1. Models C-12, R-54 use 330Ω in this application.
Note 2. Models C-12, R-54 use 270Ω in this application.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA	
K1 K2	Antenna Filter Audio Coupling	100mmf, 1.2meg 220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	89-4204 ①	Sprague Aerovox Centralab Cornell-Dubilier Mallory Sprague	PRC-9 PA-113-2 PC-151 116TM2 MS-107 DT-2

① Models C-12, R-54 use 100mmf capacitor only.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	†						
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	Input IF	14-455 ①	16-6758	16-6758	BC-352	12-C1	RF-1	
L5	Output IF	14-455 ①	16-6758	16-6758	BC-353	12-C2	RF-2	
L6	Hash Choke	14-202						10uh
L7	"A" Lead Hash Choke							1.2uh

† Part of Tuner M3. ① Part #1655-6 used in Models C-12 & R-54.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12V @ 1.6A	440 VCT @ .045A		76-600-12①						

① Part #76-600-6 used in 6V version R-54B. Part #TV555 used in Model C-12, R-54.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2100Ω	3-4Ω	75A1025 ①	24S50	A-2928	AU-603	A-3876	24S50	S-2X	

① Part #TO-4502P used in Models C-12, R-54.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	* 73-264B	5A1R	Model R-54B
	5"	PM	3-4Ω	† PM705B	5A21	Model C-12
	5"	PM	3-4Ω	‡ PM263	5A07	Model R-54

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	12V	115∿	113-55 *	6330	G883	6330	
	Interruptor	6V	115∿	113-83	5715	M1501	5715	

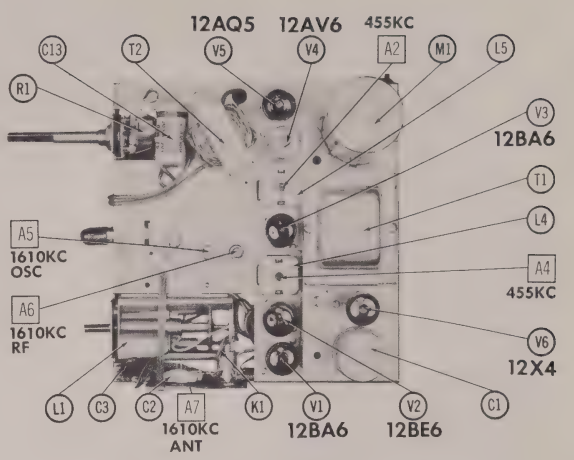
* Part #V55 used in Models C-12, R-54.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	7½A 32V	108-100 ①		307007.5	155009	SFE 7½	HHH

① 6 Volt versions use 14A 32V fuse in this application (Part #108-200).
Models C-12, and R-54 use 7½A 32V in this application (Part #A150).

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M3	Tuner	78A1027	Model R-54B
	Tuner	78-4555	Model R-54B
	Tuner	78-555	Model R-54
	Tuner	PT-555	Model C-12
M4	Spark Plate		

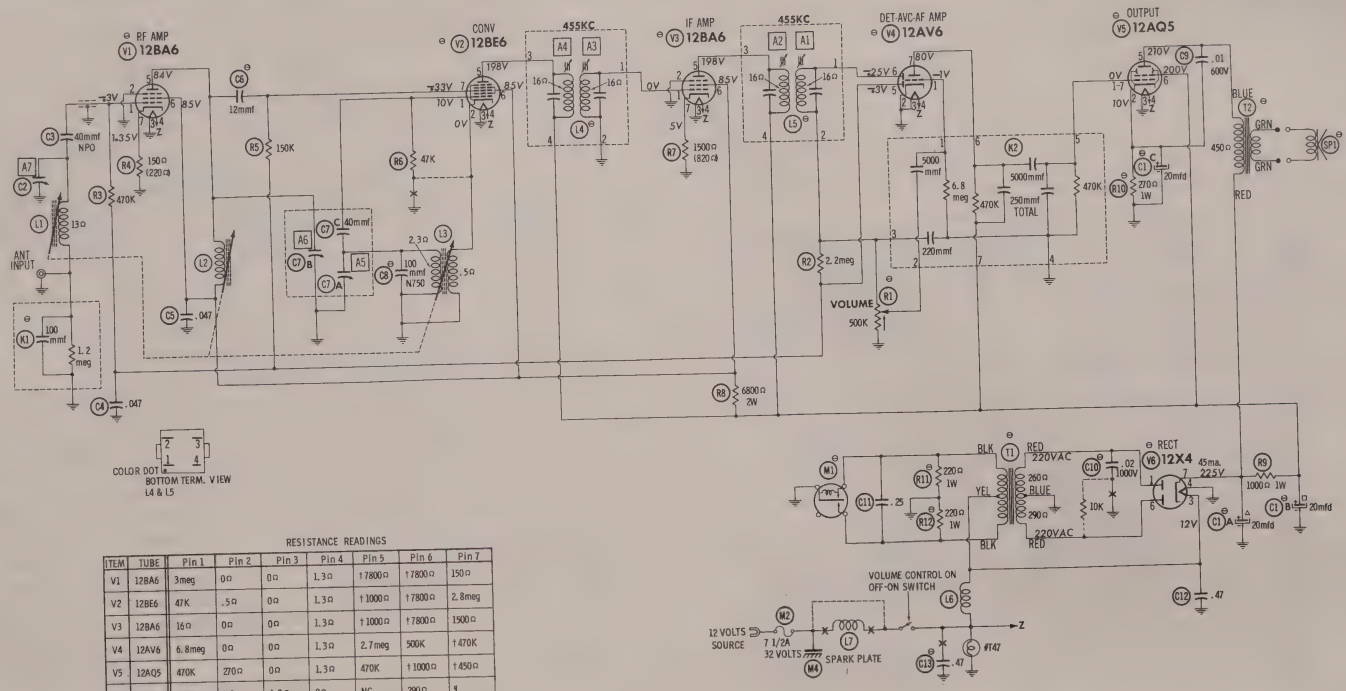
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47B312-1	Tuning, Volume, Model R-54B
Knob	H-38	Tuning, Volume, Model C-12, R-54
Dial Scale	39D464	Model R-54B
Dial Scale	D-34	Model C-12, R-54
Pointer	84A158	Model R-54B
Pointer	PS-34	Model C-12, R-54

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	3meg	0Ω	0Ω	1.3Ω	†7800Ω	†7800Ω	150Ω
V2	12BE6	47K	.5Ω	0Ω	1.3Ω	†1000Ω	†7800Ω	2.8meg
V3	12BA6	16Ω	0Ω	0Ω	1.3Ω	†1000Ω	†7800Ω	1500Ω
V4	12AV6	6.8meg	0Ω	0Ω	1.3Ω	2.7meg	500K	†470K
V5	12AQ5	470K	270Ω	0Ω	1.3Ω	470K	†1000Ω	†450Ω
V6	12X4	260Ω	NC	1.3Ω	0Ω	NC	290Ω	¶

† MEASURED FROM PIN 7 OF V6.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AUTOMATIC MODELS
C-21, R-54, R-54B

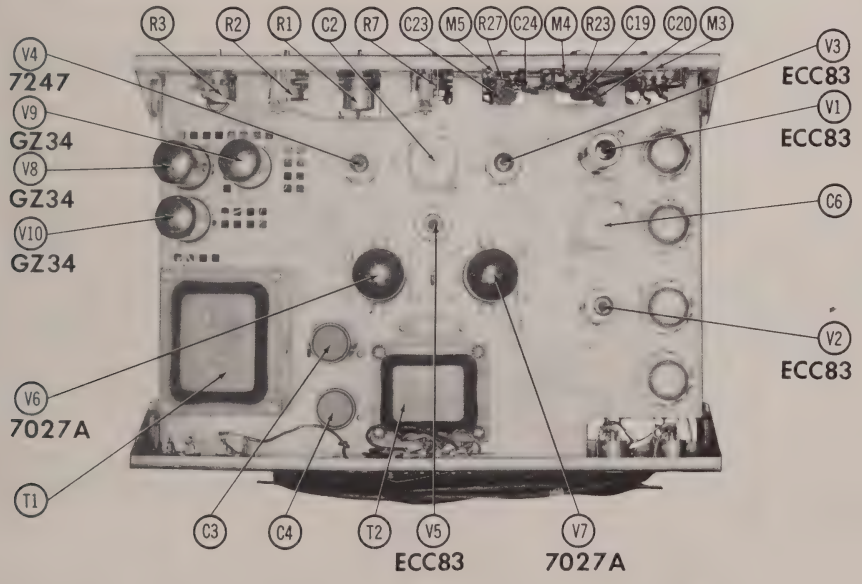
PHOTOFACT® Folder

BOGEN MODEL MX60

BOGEN MODEL MX60

TRADE NAME	Bogen Model MX60		
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P. O. Box 500, Paramus, N. J.		
TYPE SET	AC Operated 10 Tube Audio Amplifier		
POWER SUPPLY	110 - 125 Volts AC, 60 Cycles	RATING	125 Watts, 1.2 Amp. @117 Volts AC

BOGEN MODEL MX60



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JX817

SET 482 FOLDER 6

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Phono Preamp. - Mic 1 Preamp.	ECC83/12AX7
V2	Mic 2 Preamp. - Mic 3 Preamp.	ECC83/12AX7
V3	Mic 4 Preamp. - AF Mixer	ECC83/12AX7
V4	AF Amplifier	7247
V5	AF Amplifier - Phase Inverter	ECC83/12AX7
V6	Output	7027A
V7	Output	7027A
V8	Rectifier	GZ34/5AR4
V9	Rectifier	GZ34/5AR4
V10	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	20	500	79-001-147	PRS1830	BR2050	TC83	TD-20-500	TVA-1906	
C2A	■20	450	78-010-001 ①	AFH4-14	D0130	FP444	TMQ-12	TVL-4763	
B	▲20	450							
C	▲20	350							
D	20	350							
C3	40	300	79-010-024	AFH1-40	A0380	FP146	TMS-37	TVL-1622	
C4	40	300	79-010-024	AFH1-40	A0380	FP146	TMS-37	TVL-1622	
C5	20	250		PRS1570	BR2025	TC55	TD-20-250	TVA-1508	
C6A	5	200							
B	5	200							
C	5	200							
D	5	200							
C7	30	150	79-001-078	PRS1460	BR3015	TC47	TD-30-150	TVA-1412	
C8	30	150	79-001-078	PRS1460	BR3015	TC47	TD-30-150	TVA-1412	
C9	100	3		PWE3100	EC100-6	TT6X100	ML100-3	TE1059.5	

① Some versions may use 20-20-10-10mfd for C2.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	68 10%		DI-68	DD-680	L10Q68	CCD-680	GP468	10TS-Q68
C11	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C12	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP150	5HK-S15
C13	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C14	680 10%		DI-680	DD-681	IR5T68	CCD-681	GP368	10TS-T68
C15	1500 10%		BPD-0015	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C16	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C17	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C18	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C19	4700 10%		DI-4700		PM6D47	CCD-472	JL-247	10TS-D47
C20	1500 10%		DI-1500	DD-152	BYA10D15	CCD-152	GP215	10TS-D15
C21	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C22	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C23	4700 10%		DI-4700		PM6D47	CCD-472	JL-247	10TS-D47
C24	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C25	.033 200V		P288N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C26	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C27	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C28	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP150	5HK-S15
C29	22 10%		DI-22	DD-220	L10Q22	CCD-220	GP422	10TS-Q22
C30	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C31	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C32	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C33	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C34	1200 10%		DI-1200	DD-122	IR5D12	CCD-122	GP212	10TS-D12
C35	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C37	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C38	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C39	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1/2	77-001-377	B-60-S	A47-500K-Z	Q13-133	U48	Master Gain
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	1meg	1/2	77-001-441	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	1/2	77-001-442	BT-65	A47F5-500K	Q19-133X	UT-431	Treble
	250K Tap							
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	1/2	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	1/2	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	500K	1/2	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R7A	500K	1/2	77-001-367	B-60	A47-500K-Z	Q13-133	U48	Mic 4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R8A	10K	1/2	77-001-400	AB-14	A47-10K-S	B11-116	SU-20	Bias #1
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R9A	10K	1/2	77-001-400	AB-14	A47-10K-S	B11-116	SU-20	Bias #2
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R10A	50Ω	1/2	77-001-113	WN-500	A43-500	WPK-084	R50L	Hum Adjust
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R11	47K	
R12	3.3meg	
R13	100K	
R14	150K	(100K) *
R15	3.3meg	
R16	82K	
R17	3.3meg	
R18	100K	
R19	47K	
R20	3.3meg	
R21	100K	
R22	47K	
R23	180K	
R24	3.3meg	
R25	100K	
R26	47K	
R27	180K	
R28	3.3meg	
R29	100K	
R30	47K	
R31	270K	

* Alternate Value.

ITEM No.	RATING	REMARKS
R32	220K	
R33	220K	
R34	330K	
R35	100K	
R36	33K	
R37	560Ω	
R38	470Ω	
R39	68K	
R40	1.5meg	
R41	150K	
R42	470K	
R43	330K	
R44	100K	
R45	1500Ω	
R46	82K 1W	
R47	15K	
R48	1200Ω	
R49	47K	
R50	6.8meg	
R51	1600Ω	
R52	1meg	

ITEM No.	RATING	REMARKS
R53	82K	
R54	47K	
R55	82K	
R56	4700Ω	
R57	1000Ω	
R58	100K	
R59	10Ω	
R60	1000Ω	
R61	100K	
R62	10Ω	
R63	1000Ω	
R64	39K	
R65	33K	
R66	220K	
R67	220K	
R68	220K	
R69	220K	
R70	1meg	
R71	1meg	
R72	2200Ω	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	125V @ 1.1A Tap @ 117V @ 1.2A	820VCT @ .100A Tap @ 640VCT @ .01A, 65V @ .002A	5V @ 1.9A	83-612-000						
	SEC. 3	SEC. 4	SEC. 5							
	5V @ 3.8A	6.3V @ .9A	6.3VCT @ 3.9A							

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6400Ω CT	16Ω Tap ② 8Ω, 4Ω SEC.2 64Ω	83-300-100							

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BOGEN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.002A	*	D-5410 *	1159 *	10 *		Selenium Type *

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BOGEN PART No. FUSE	BOGEN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	1.5A 125V S/B			313001.5 (1½A 125V S/B)	342001	MDX 1½	HKP

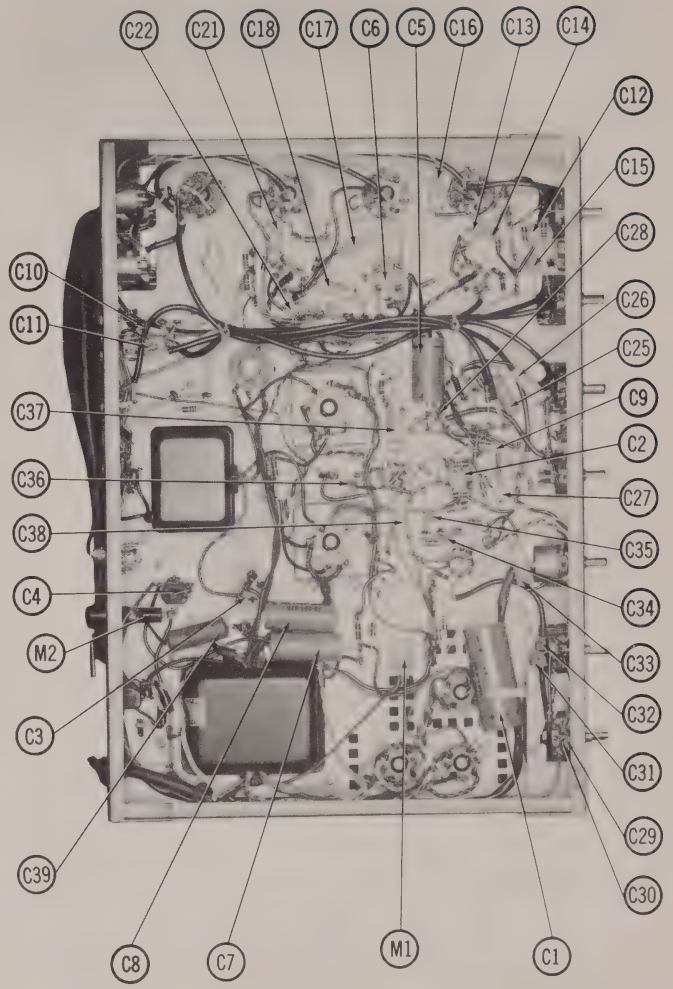
MISCELLANEOUS

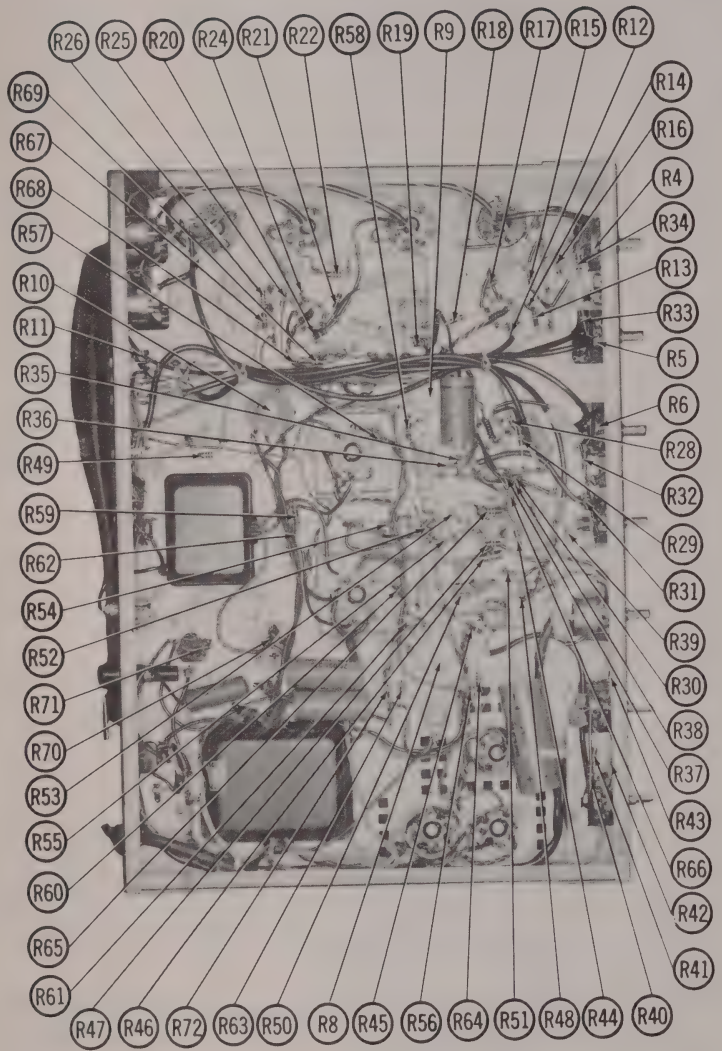
ITEM No.	PART NAME	BOGEN PART No.	NOTES
M3	Switch		Selector (DP 3 Position Slide Type)
M4	Switch		Speech Filter Mic 2 (DPDT Slide Type)
M5	Switch		Speech Filter Mic 3 (DPDT Slide Type)

WIRING DATA

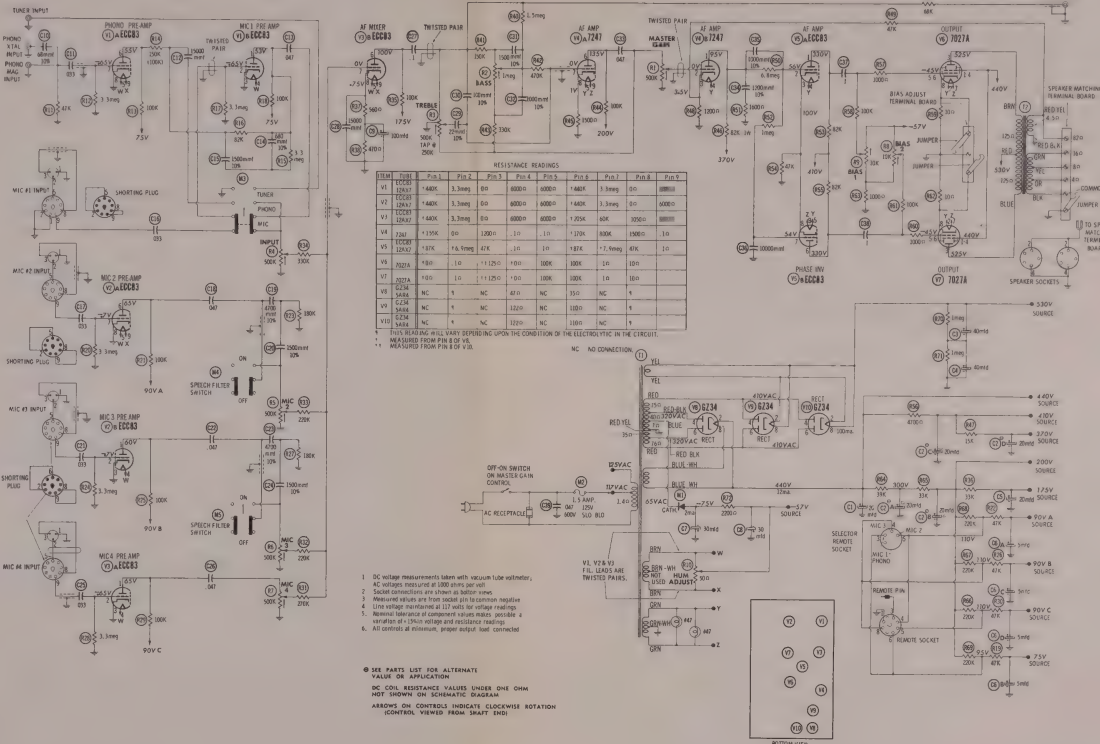
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 ECC81	†440K	3.3meg	0Ω	6000Ω	6000Ω	†440K	3.3meg	0Ω	900Ω
V2	12AX7 ECC81	†440K	3.3meg	0Ω	6000Ω	6000Ω	†440K	3.3meg	0Ω	900Ω
V3	12AX7	†440K	3.3meg	0Ω	6000Ω	6000Ω	†205K	60K	325Ω	
V4	7247 ECC81	†135K	0Ω	1250Ω	10	10	†120K	800K	1500Ω	10
V5	12AX7	†87K	†6.9meg	47K	10	10	†87K	†7.4meg	47K	10
V6	7027A	†0Ω	10	††125Ω	†0Ω	100K	100K	1M	10Ω	
V7	7027A	†0Ω	10	††125Ω	†0Ω	100K	100K	1M	10Ω	
V8	6234 5AR4	NC	¶	NC	42Ω	NC	35Ω	NC	¶	
V9	6234 5AR4	NC	¶	NC	122Ω	NC	110Ω	NC	¶	
V10	6234 5AR4	NC	¶	NC	122Ω	NC	110Ω	NC	¶	

* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V8.
MEASURED FROM PIN 8 OF V10.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1,000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings
6. All controls at minimum, proper output load connected

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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BOGEN MODEL MX60

PHOTOFACT® Folder

CAPITOL MODELS 930, 933

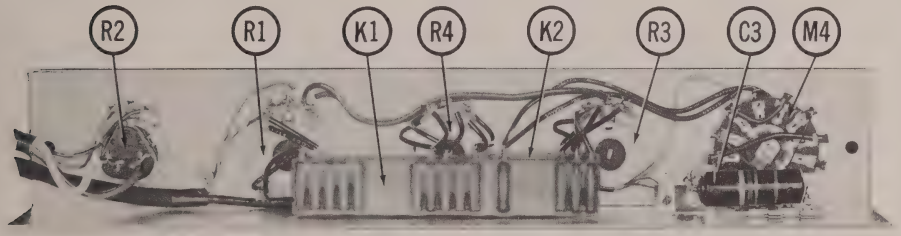
CAPITOL MODELS 930, 933

MODEL 933

CAPITOL MODELS 930, 933

TRADE NAME	Capitol Models 930, 933
MANUFACTURER	Capitol Records, Inc., 1 S. Webster Ave., Scranton 5, Pa.
TYPE SET	AC Operated 7 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 71 Watts, .7 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #1201-368 — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JT712

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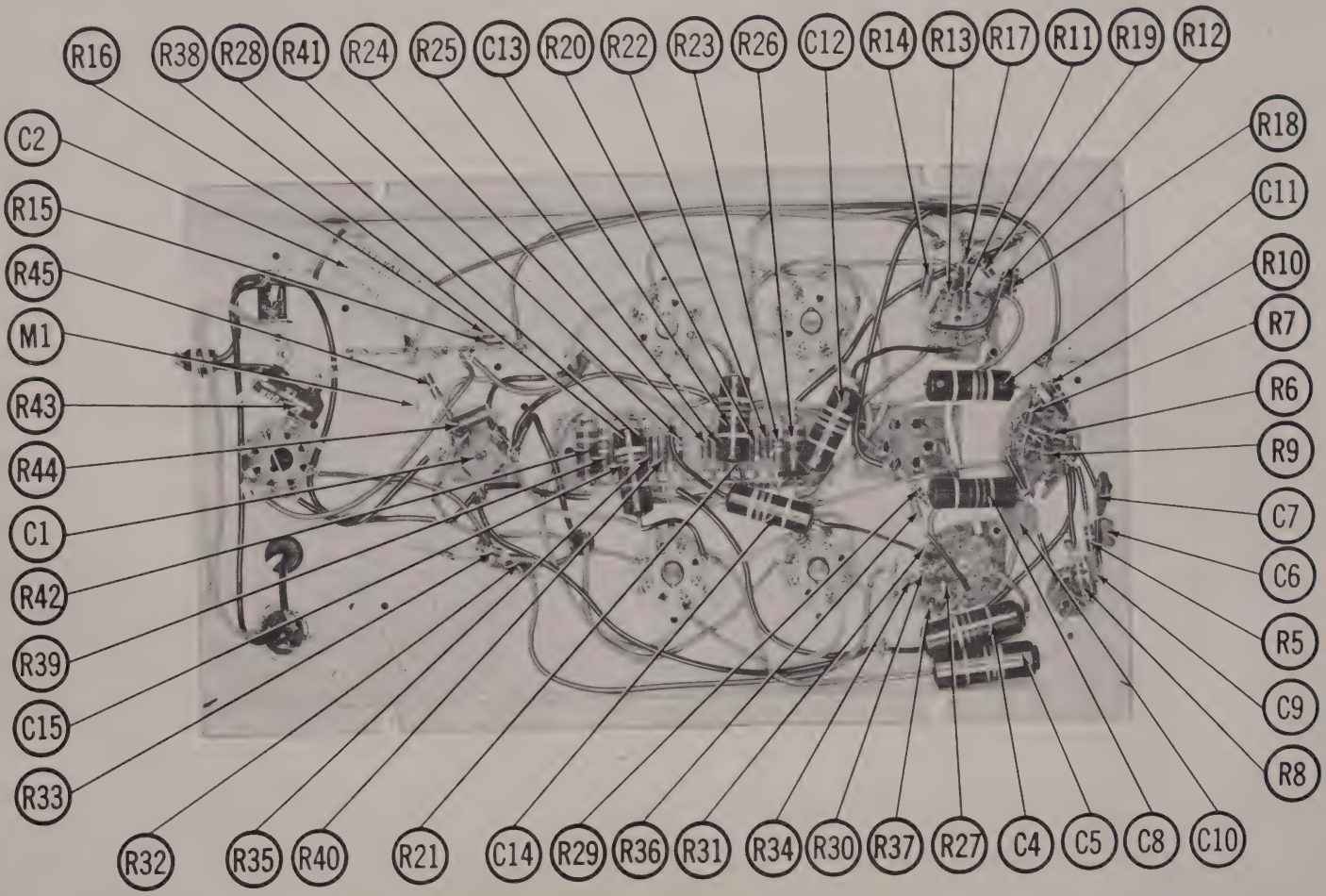
SET 482 FOLDER 7



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	12AX7
V2	Left Channel AF Amp. - Phase Inverter	12AX7
V3	Left Channel Output	25L6GT
V4	Left Channel Output	25L6GT
V5	Right Channel AF Amp. - Phase Inverter	12AX7
V6	Right Channel Output	25L6GT
V7	Right Channel Output	25L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CAPITOL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲120	150	114071	AFH3-13-30	XC0126	FP311, 9	TMT-163	TVL-3448, 2	
B	■120	150							
C2	40	150	114072	PRS1470	BR4015	TC48	TD-40-150	TVA-1413	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

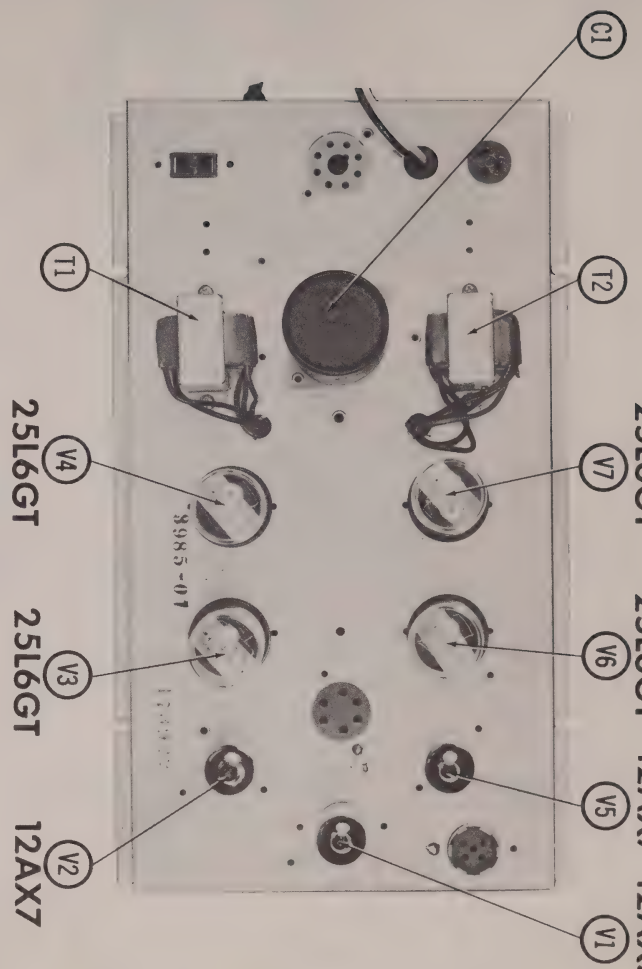
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C4	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C5	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C6	1000 10%			DD-102	1R5D1	CCD-102	GP210	10TS-D10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	1000 10%			DD-102	1R5D1	CCD-102	GP210	10TS-D10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C13	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C14	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C16	2mfd 200V	#MK-2-2M	P282Z-2, 0		MP2W2			118P20502S2
C17	2mfd 200V	#MK-2-2M	P282Z-2, 0		MP2W2			118P20502S2

Capitol Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CAPITOL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K 20K Tap	½	105185					Loudness, Right Channel
B	250K 20K Tap	½						Loudness, Left Channel
R2A	15003	½	105184			B11-109		Balance
B	Switch					SK7		Push-Pull Off-On
R3A	250K	½	105183	B-51	AD47-250K-Z		FA254A	Treble, Right Channel
B	250K	½		SR-51	Not Req.		RU254A	Treble, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	250K	½	105183	B-51	AD47-250K-Z		FA254A	Bass, Right Channel
B	250K	½		SR-51	Not Req.		RU254A	Bass, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING
R5	680K
R6	10meg
R7	100K
R8	680K
R9	10meg
R10	100K
R11	220K

ITEM No.	RATING
R12	470Ω
R13	68K
R14	2200Ω
R15	1000Ω
R16	270Ω
R17	220K
R18	470Ω

ITEM No.	RATING
R19	68K
R20	1meg
R21	1meg
R22	2200Ω
R23	470K
R24	2200Ω
R25	470K

ITEM No.	RATING
R26	68Ω 2W
R27	220K
R28	1meg
R29	470Ω
R30	68K
R31	2200Ω
R32	1000Ω

ITEM No.	RATING
R33	270Ω
R34	220K
R35	1meg
R36	470Ω
R37	68K
R38	2200Ω
R39	470K

ITEM No.	RATING
R40	2200Ω
R41	470K
R42	68Ω 2W
R43	12Ω 5W
R44	1000Ω 1W
R45	22K

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CAPITOL PART No.	REPLACEMENT DATA
K1	Tone & Loudness Comp.	680mmf, 2200mmf, 6800mmf, 20000mmf, 47000mmf, 27000Ω, 6800Ω, 39K, 47K, 56K	3985-209	
K2	Tone & Loudness Comp.	680mmf, 2200mmf, 6800mmf, 20000mmf, 47000mmf, 27000Ω, 6800Ω, 39K, 47K, 56K	3985-209	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: CAPITOL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω CT	3-4Ω	120029 ①	22S88	A-2905 ②	AU-609	A-3870	22S88	S-57Z	
T2	4000Ω CT	3-4Ω	120029 ①	22S88	A-2905 ②	AU-609	A-3870	22S88	S-57Z	

① Part #120034 (7000Ω primary, 6Ω secondary, with tertiary winding) may be used in some versions.
② Drill new mounting holes.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: CAPITOL PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	8-HB-18	8A31Z6.6	
SP2	5"	PM	6-8Ω	T5-BM-1		
SP3	8"	PM	3-4Ω	8-HB-18	8A31Z6.6	
SP4	5"	PM	6-8Ω	T5-BM-1		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA: CAPITOL PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.210A	132038	5E4	HA504	E4	SR500	

PHONO CARTRIDGE

ITEM No.	CAPITOL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	13TBX ♦ 13TX	13TX	Not Req.	13	Not Req.			10T2-SD	N10T2-SD

♦ Includes mounting bracket.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: CAPITOL PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		* W-204DS ♦†	* A-44XSD †♦	† Jewel ♦ Diamond * Includes Cartridge

MISCELLANEOUS

ITEM No.	PART NAME	CAPITOL PART No.	NOTES
M4	Switch	150087	Function (Rotary Wafer)
M5	Switch	467 *	Off-On (Part of Changer)
M6	Switch		Radio-Phono (Part of Changer)
M7	Motor	9134 *	Phono-Drive

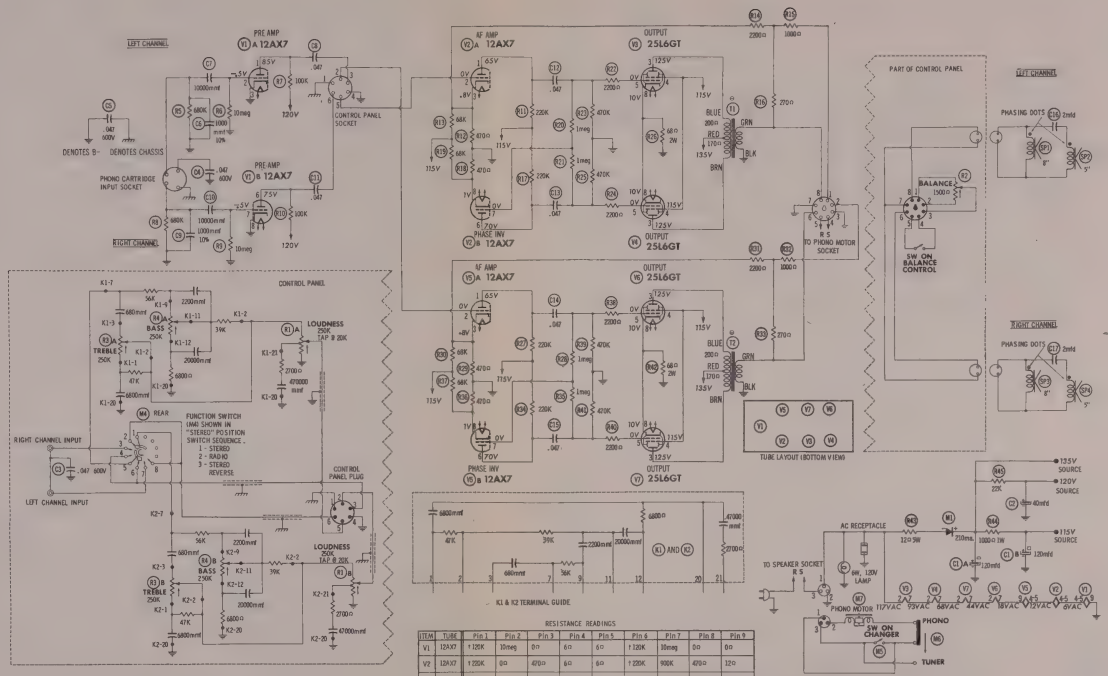
* VM Part Number.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	14700-A	Loudness, Balance, Base, Treble, Function
Knob	16794-A46 *	Off-On Reject
Knob	16793-A46 *	Speed Control
Cabinet	CA933C	Model 933
Cabinet	CA930C	Model 930
Cabinet	CA933S	Speaker, Model 933
Cabinet Legs	CA933CL	Model 933
Cabinet Legs	CA930CL	Model 930
Cabinet Legs	CA933SL	Speaker, Model 933

* VM Part Number.



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†125K	10meg	0Ω	6Ω	6Ω	†125K	10meg	0Ω	0Ω
V2	12AX7	†225K	0Ω	470Ω	6Ω	6Ω	†225K	900K	470Ω	12Ω
V3	25L6GT	NC	118Ω	†200Ω	†1000Ω	470K	TP	93Ω	68Ω	
V4	25L6GT	NC	93Ω	†170Ω	†1000Ω	470K	NC	68Ω	68Ω	
V5	12AX7	†220K	0Ω	470Ω	12Ω	12Ω	†220K	900K	470Ω	18Ω
V6	25L6GT	NC	43Ω	†200Ω	†1000Ω	470K	TP	18Ω	68Ω	
V7	25L6GT	NC	68Ω	†170Ω	†1000Ω	470K	NC	43Ω	68Ω	

RESISTANCE READINGS

† MEASURED FROM OUTPUT OF MFL
TP TIE POINT
NC NO CONNECTION

@ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

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CAPITOL MODELS 930, 933

PHOTOFACT® Folder

EICO MODEL HF-85

EICO MODEL HF-85

EICO MODEL HF-85

TRADE NAME	Eico Model HF-85
MANUFACTURER	Electronic Instrument Co., Inc., 33-00 Northern Blvd., Long Island City 1, N. Y.
TYPE SET	AC Operated 6 Tube Stereo Preamplifier
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 25 Watts, .23 Amp. @117 Volts AC

SET 482 FOLDER 8

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JU650

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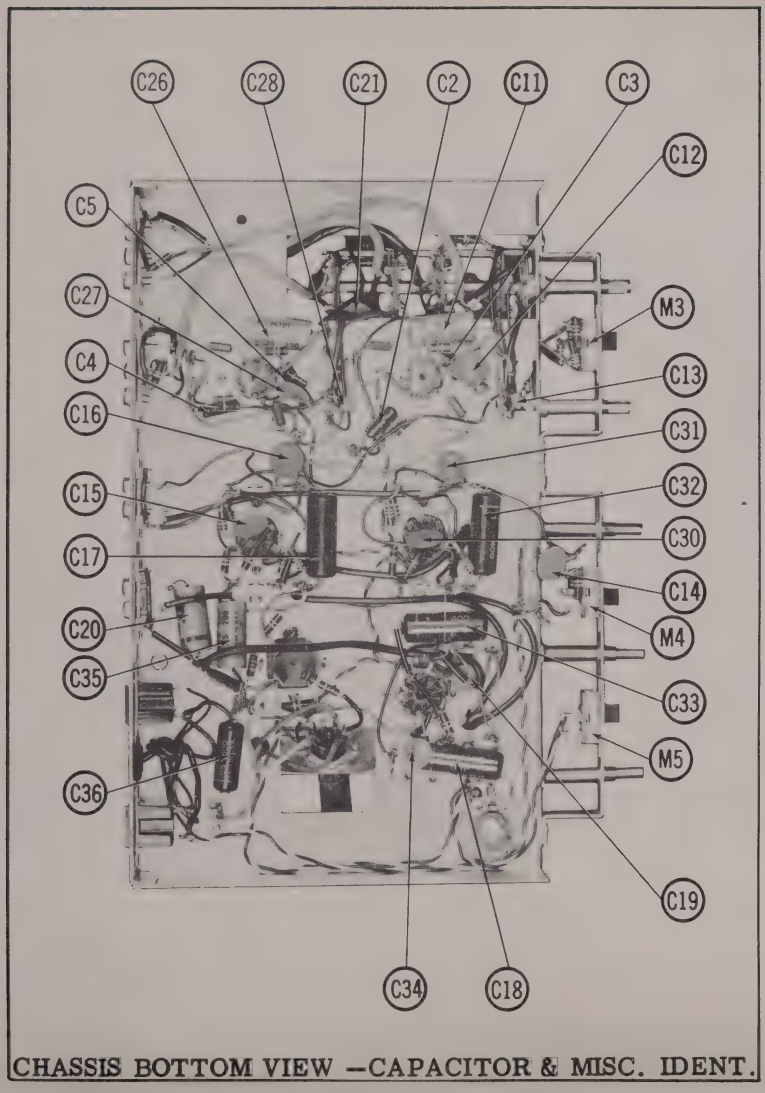
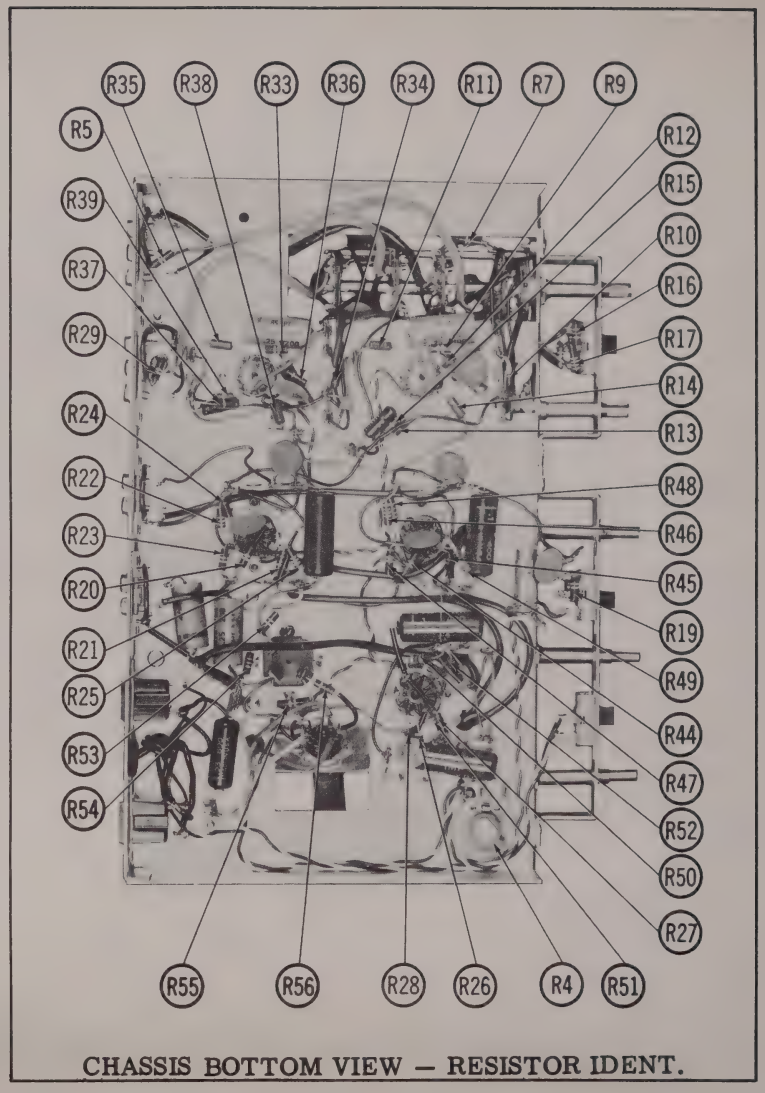


CHASSIS BOTTOM VIEW –CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW – RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 Preamp.	ECC83/12AX7
V2	Channel 1 AF Amp.	ECC83/12AX7
V3	Channel 1 AF Amp. - Channel 2 AF Amp.	ECC83/12AX7
V4	Channel 2 Preamp.	ECC83/12AX7
V5	Channel 2 AF Amp.	ECC83/12AX7
V6	Rectifier	EZ90/6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	EICO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	20	400	24005					TVLS-3673. 7*	
B	40	350							
C	40	350							
C2	10	6	23014	XPP-6010	NLW10-6	TT6X10	ML10-6	TE-1087	
C3	25	6	23020	XPP-6025	NLW25-6	TT6X25	TD-25-25	TE-1091	
C4	10	6	23014	XPP-6010	NLW10-6	TT6X10	ML10-6	TE-1087	
C5	25	6	23020	XPP-6025	NLW25-6	TT6X25	TD-25-25	TE-1091	

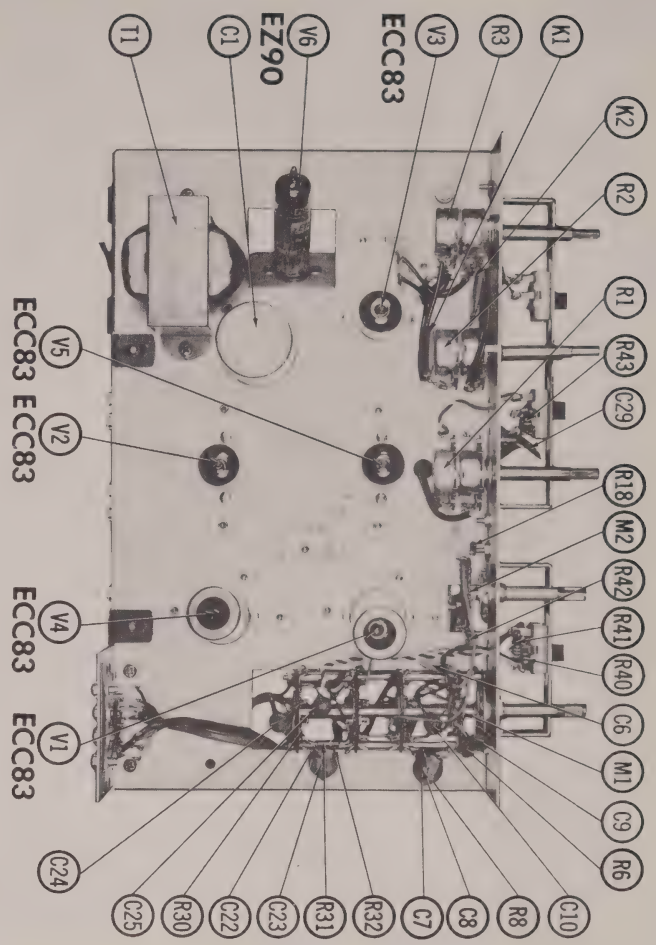
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C7	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C8	2700 10%		DI-2700		PM6D3	CCD-272	GEM-1623	10TS-D27
C9	850 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C10	600 10%		DI-680	DD-601	1R5T6	CCS-621	GP360	10TS-T60
C11	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C12	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C13	1200 10%		DI-1200	DD-122	1R5D12	CCD-122	GP212	10TS-D12
C14	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C15	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C16	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C17	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104		4TM-P1
C18	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104		4TM-P1
C19	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C20	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C21	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C22	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C23	2700 10%		DI-2700		PM6D3	CCD-272	GEM-1623	10TS-D27
C24	850 10%		DI-820	DD-821	1R5T82	CCD-821	GP382	10TS-T82
C25	600 10%		DI-680	DD-601	1R5T6	CCS-621	GP360	10TS-T60
C26	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C27	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C28	1200 10%		DI-1200	DD-122	1R5D12	CCD-122	GP212	10TS-D12
C29	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C30	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C31	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C32	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104		4TM-P1
C33	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104		4TM-P1
C34	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP150	5HK-S15
C35	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C36	.03 600V		P688N-03	DD-303	CUB6S3	6DP-3-303	GEM-613	6TM-S3

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EICO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	18053					Level, Channel 1
B	50K Tap 500K 50K Tap	½						Level, Channel 2
R2A	1meg	½	18054					Bass, Channel 1
B	1meg	½						Bass, Channel 2
R3A	500K	½	18052					Treble, Channel 1
B	500K	½						Treble, Channel 2
R4A	100Ω	2WW	19009	WN-101	A43-100	W11-084	R100L	Hum Adjust
B	Shaft			Not Req.	FKS 1/4	SK5	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	100K	
R6	90K 5%	
R7	100K	
R8	2.2meg	
R9	10K	
R10	1meg	
R11	200K 5%	
R12	2200Ω	
R13	1meg	
R14	200K 5%	
R15	4700Ω	
R16	68K	
R17	330K	
R18	6800Ω	
R19	10K	
R20	220K	
R21	2200Ω	
R22	470K	

ITEM No.	RATING	REMARKS
R23	100K	
R24	2200Ω	
R25	33K	
R26	470K	
R27	100K	
R28	1000Ω	
R29	100K	
R30	90K 5%	
R31	2.2meg	
R32	100K	
R33	10K	
R34	1meg	
R35	200K 5%	
R36	2200Ω	
R37	1meg	
R38	200K 5%	
R39	4700Ω	
R40	68K	

ITEM No.	RATING	REMARKS
R41	330K	
R42	6800Ω	
R43	10K	
R44	220K	
R45	2200Ω	
R46	470K	
R47	100K	
R48	2200Ω	
R49	33K	
R50	470K	
R51	100K	
R52	1000Ω	
R53	220K	
R54	68K	
R55	10K 1W	
R56	2200Ω	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	EICO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	117V@ .23A	580 VCT @ .010A	6.3V@ 2.2A	30027						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EICO PART No.	REPLACEMENT DATA	
K1	Tone Comp.	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	29751	Aerovox Centralab	PA-694 PC-342
K2	Tone Comp.	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	29751	Aerovox Centralab	PA-694 PC-342

MISCELLANEOUS

ITEM No.	PART NAME	EICO PART No.	NOTES
M1	Switch	60057	Input Selector
M2	Switch	60065	Mode Selector
M3	Switch	62000	Tape Speed (DPDT, Slide Type)
M4	Switch	62000	Loudness Control (DPDT, Slide Type)
M5	Switch	62001	Off-On (SPST, Slide Type)

CABINETS & CABINET PARTS

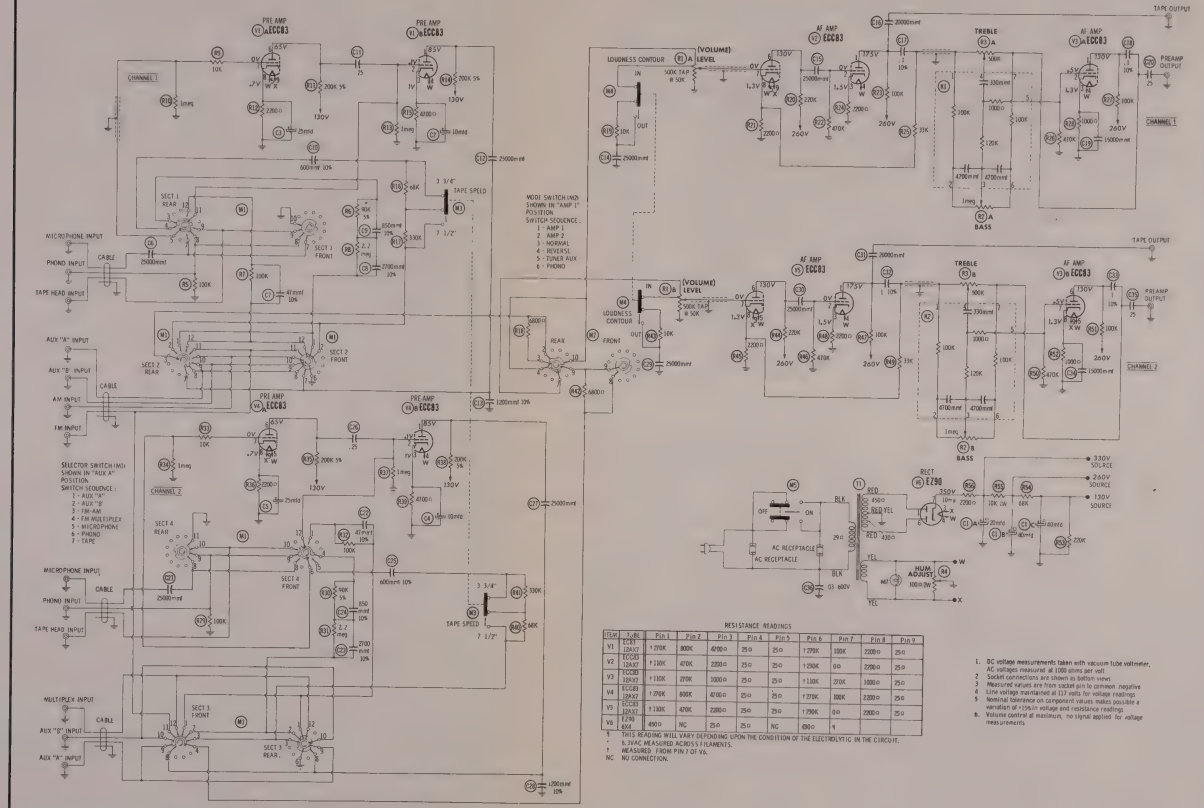
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	53016	Amp. 1 Level, Amp. 1 Bass, Amp. 1 Treble
Knob	53022	Amp. 2 Level, Amp. 2 Bass, Amp. 2 Treble
Knob	53018	Function Selector, Mode Selector

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TYPE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	1270K	800K	470Ω	25Ω	25Ω	1270K	100K	220Ω	25Ω
V2	ECC83 12AX7	1100K	470K	220Ω	25Ω	25Ω	1250K	0Ω	220Ω	25Ω
V3	ECC83 12AX7	1100K	270K	100Ω	25Ω	25Ω	1100K	270K	100Ω	25Ω
V4	ECC83 12AX7	1270K	800K	470Ω	25Ω	25Ω	1270K	100K	220Ω	25Ω
V5	ECC83 12AX7	1100K	470K	220Ω	25Ω	25Ω	1250K	0Ω	220Ω	25Ω
V6	EZ90 6X4	400Ω	NC	25Ω	25Ω	NC	450Ω	1		

1. THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
2. 3VAC MEASURED ACROSS 7 FILAMENTS.
3. MEASURED FROM PIN 7 OF V6.

NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom view.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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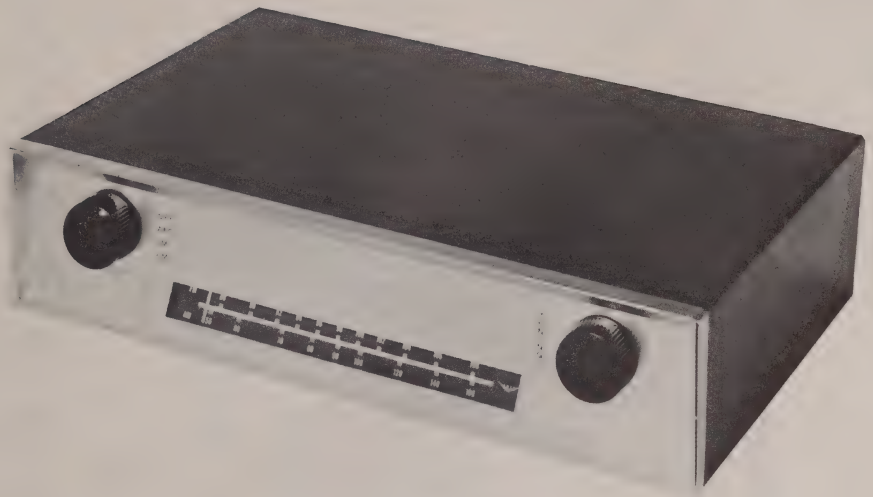
EICO MODEL HF-85

PHOTOFACT® Folder with CIRCUITRACE®

**ERIE MODEL
EM-085-ER**

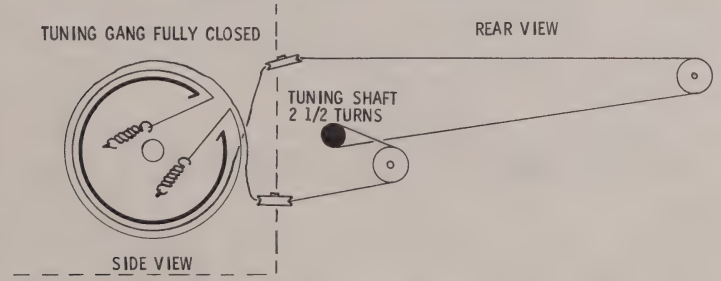
ERIE MODEL
EM-085-ER



ERIE MODEL
EM-085-ER

TRADE NAME	Erie Model EM-085-ER		
MANUFACTURER	Erie Resistor Corp., 644 W. 12th Street, Erie, Pa.		
TYPE SET	AC Operated 7 Tube FM-AM Tuner		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	28 Watts, .3 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 — 1625KC	FREQ. MOD.	88 - 108MC

DIAL CORD STRINGING



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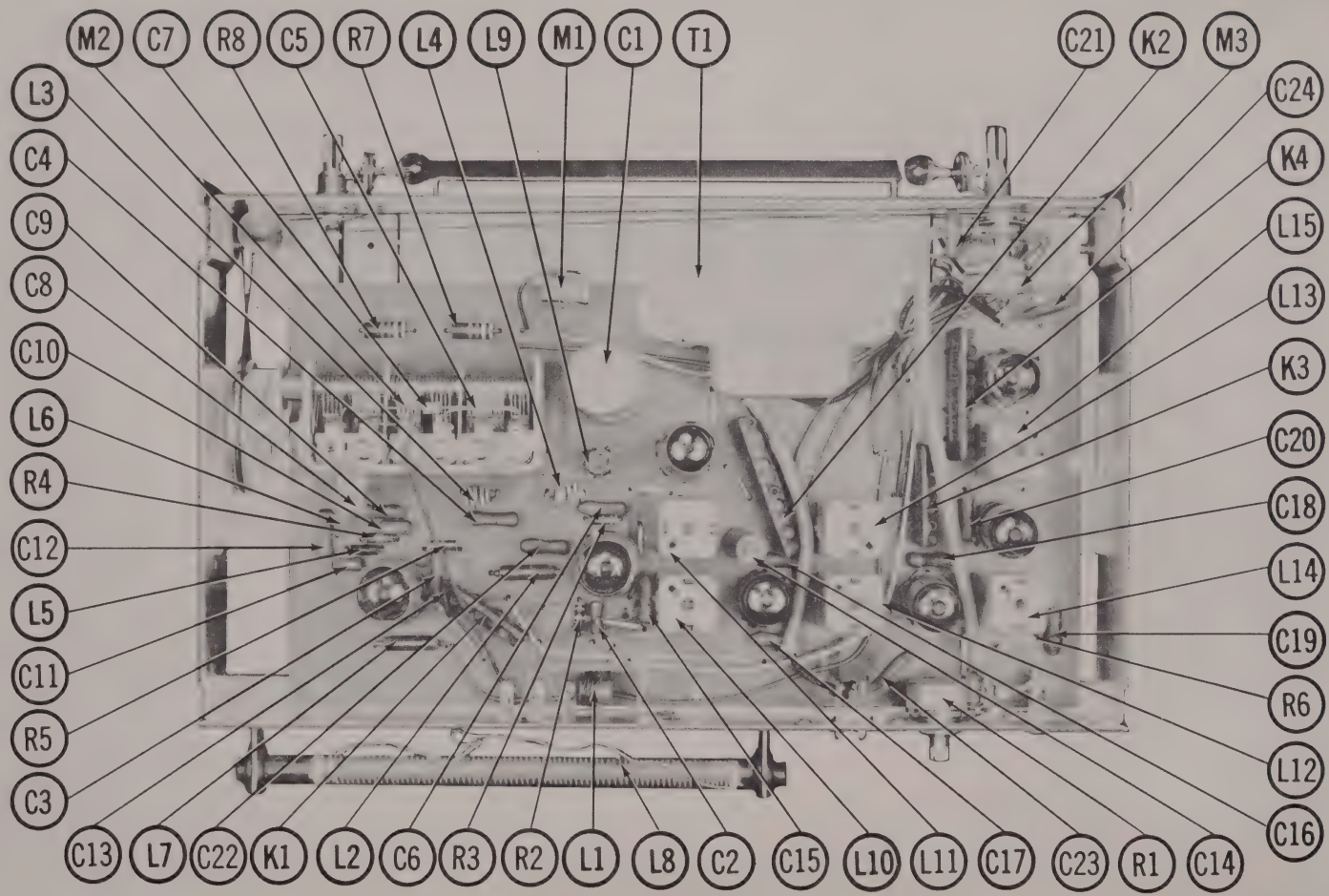
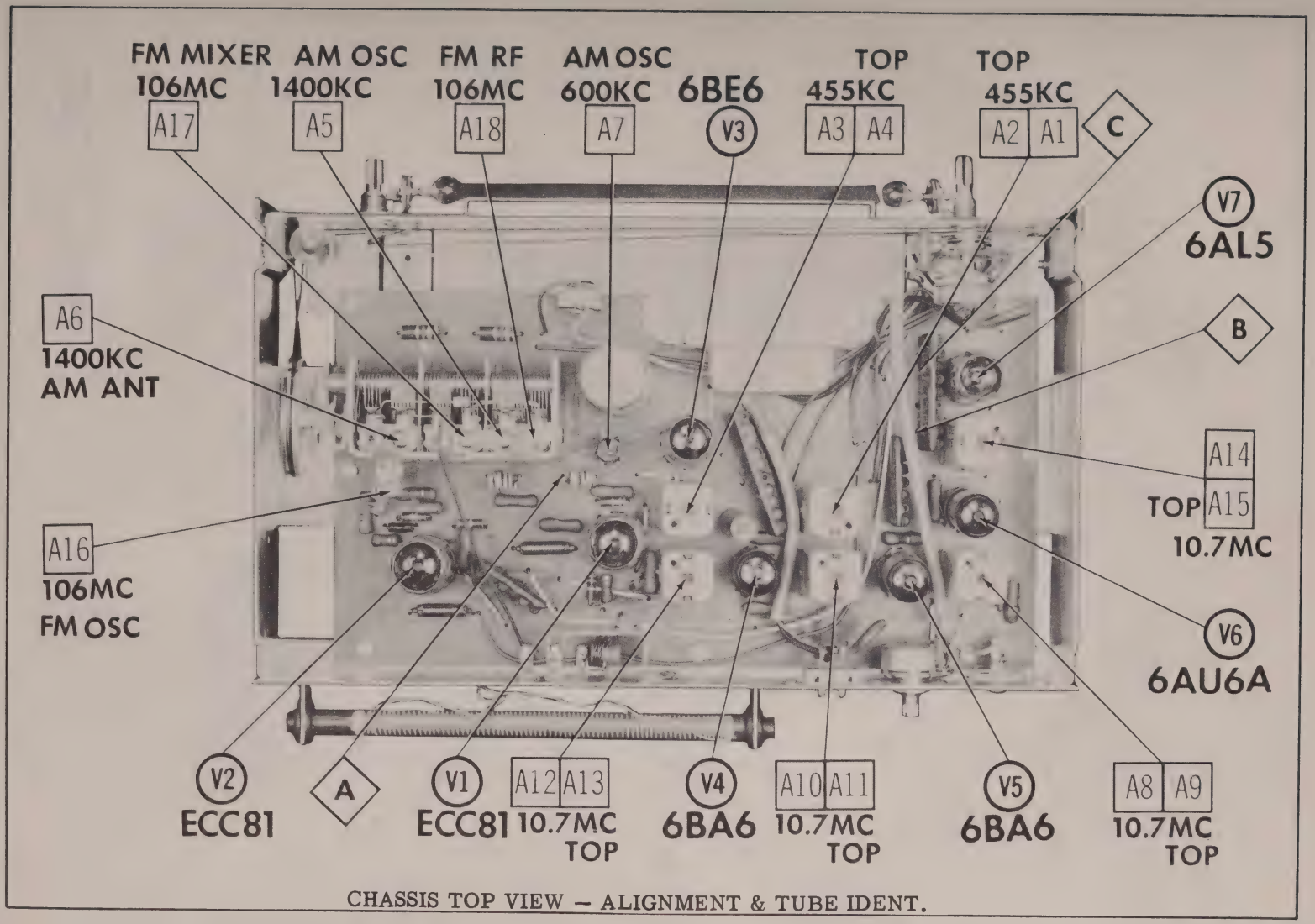


CHASSIS TOP VIEW – CAPACITOR, RESISTOR, INDUCTOR & MISC. IDENT.



CHASSIS TOP VIEW — ALIGNMENT & TUBE IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication on VTVM.
Turn Level control to maximum output.
Suggested alignment tools:

A1 thru A4, A8 thru A15.....	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A6, A16, A17, A18.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A7.....	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side .01mfd to AM antenna terminal. Low side to chassis.	455KC (400% Mod.)	(AM) Tuning gang fully open.	AC probe to output jack. Common to chassis.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1400KC	1400KC	"	A5, A6	Adjust for maximum deflection.
3.	"	600KC	600KC	"	A7	Adjust for maximum deflection. Repeat Steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point (A). Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to pin 1 (grid) of FM Limiter. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A14	"
6.	"	"	"	DC probe to point (C). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE — SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point (A). Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to pin 1 (grid) of FM Limiter. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1.
5.	"	"	"	Vert. amp. thru 47K to point (B). Low side to chassis.	A14	"
6.	"	"	"	Vert. amp. to point (C). Low side to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 120Ω in each lead.	106MC (Unmod.)	(FM) 106MC	DC probe to pin 1 (grid) of FM Limiter. Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
8.	"	90MC	90MC	"	L3, L4, L6	Adjust by expanding or compressing coil turns for maximum deflection. Repeat Steps 7 and 8.

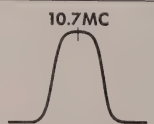
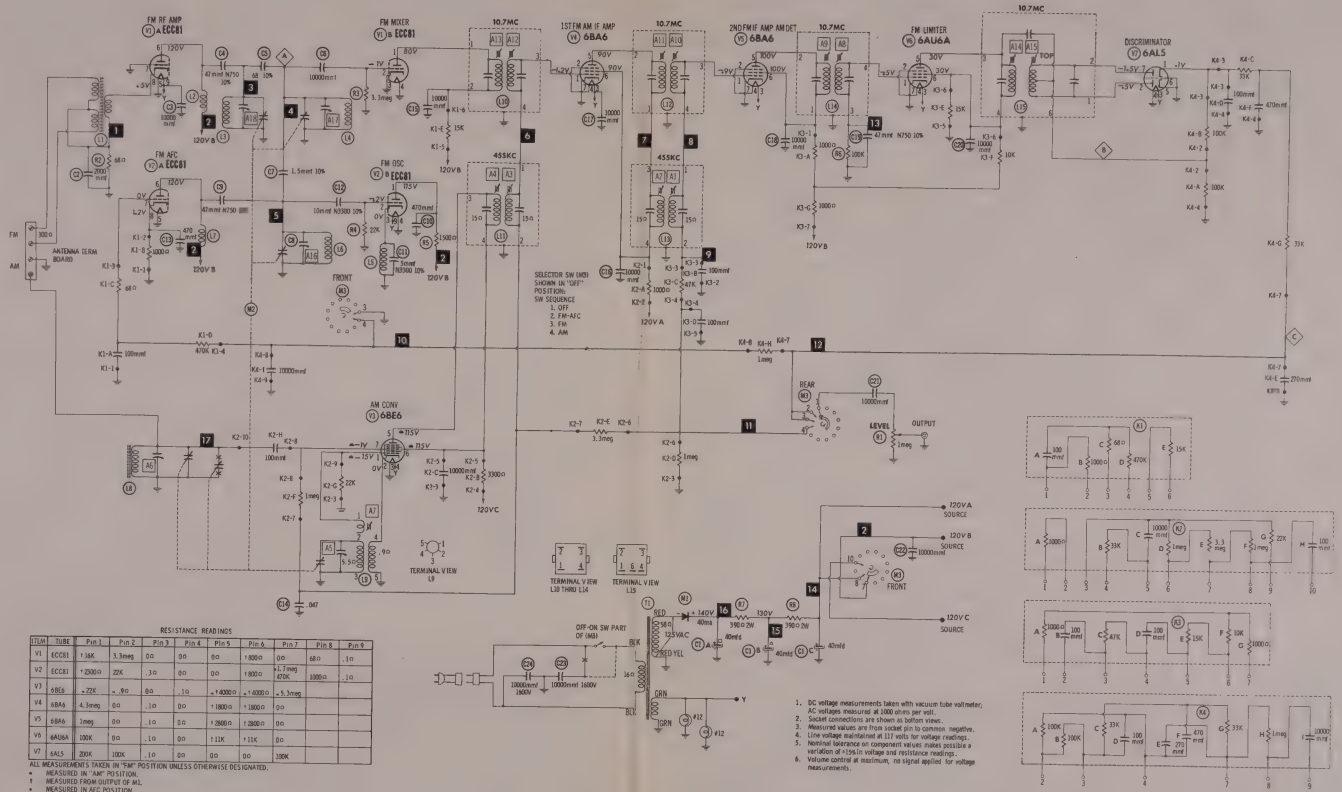


FIG. 1

FIG. 2



RESISTANCE READINGS

TUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CC81	†1MΩ	3.3meg	0Ω	0Ω	0Ω	†800Ω	0Ω	68Ω	.1Ω
V2	6CC81	†2500Ω	22K	.3Ω	0Ω	0Ω	†800Ω	1.7meg 470K	1000Ω	.1Ω
V3	6BE6	₊22K	₋.9Ω	0Ω	.1Ω	₊†4000Ω	₊†4000Ω	₊5.3meg		
V4	6BA6	4.3meg	0Ω	.1Ω	0Ω	†1800Ω	†1800Ω	0Ω		
V5	6BA6	1meg	0Ω	.1Ω	0Ω	†2800Ω	†2800Ω	0Ω		
V6	6AU6A	100K	0Ω	.1Ω	0Ω	†11K	†11K	0Ω		
V7	6AL5	220K	100K	.1Ω	0Ω	0Ω	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
- MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1.
₊ MEASURED IN AFC POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±1%in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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ERIE MODEL EM-085-ER

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆		◆ RAYTHEON ◆	SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF-FM Mixer	ECC81 (12AT7) *	V5	2nd FM IF Amp. - AM Det.	6BA6
V2	FM AFC-FM Osc.	ECC81 (12AT7) *	V6	FM Limiter	6AU6A
V3	AM Converter	6BE6	V7	Discriminator	6AL5
V4	1st FM-AM IF Amp.	6BA6			

* Alternate.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ERIE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	150		PWH3-11-30		PFP311.63		PCLS-3440 *	
B	▲40	150							
C	40	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	2000		SI 2000	D6-202	BYA10D2	CCD-202	GP220	5HK-D20
C3	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	.68 10%		NPO-SI. 68	TCZ-R68				
C6	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C8								
C9	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C10	470		SI 470	D6-471	BYA10T47	CCD-471	GP347	10TS-T47
C11	5 N3300 10%					*		
C12	10 N3300 10%					*		
C13	470		SI 470	D6-471	BYA10T47	CCD-471	GP347	10TS-T47
C14	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C15	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C16	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C17	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	47 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C20	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C21	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	10000		SI 10000	D6-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	10000 1600V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
C24	10000 1600V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ERIE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	229	BX-69	A47-1meg-S	B11-137	SU-54	Level
B	Shaft			Not Req.	FKS-1/4	SK2	Not Req.	

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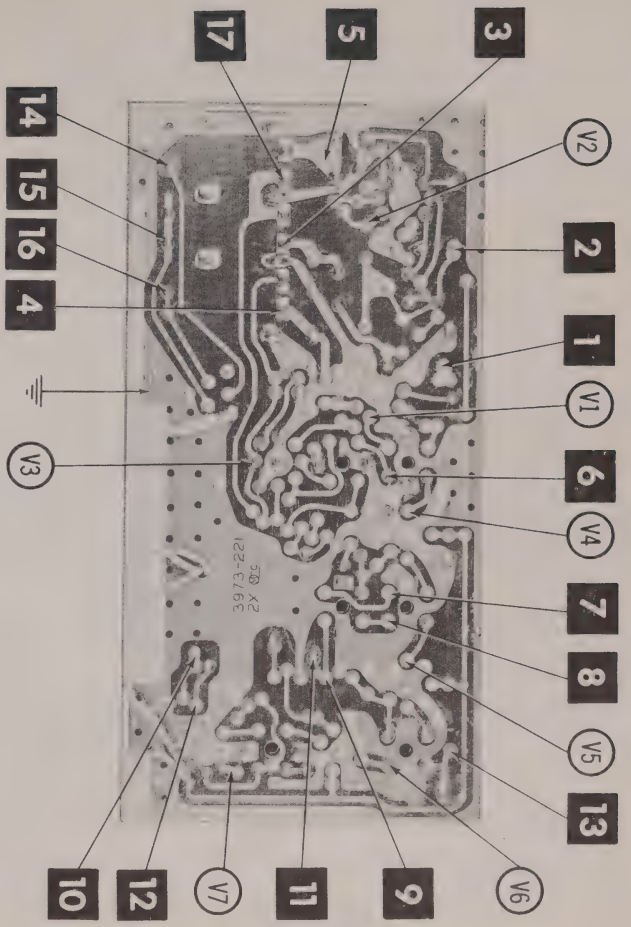
PRINTED BOARD

ERIE MODEL EM-085-ER



ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	68Ω	
R3	3.3meg	
R4	22K	

ITEM No.	RATING	REMARKS
R5	1500Ω	
R6	100K	
R7	390Ω 2W	

ITEM No.	RATING	REMARKS
R8	390Ω 2W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ERIE PART No.	REPLACEMENT DATA
K1	AFC-IF Circuitry	100mmf, 68Ω, 1000Ω, 15K, 470K	3973-230-1	
K2	Converter-IF Circuitry	100mmf, 10000mmf, 1000Ω, 22K, 3300Ω, 1meg, 1meg, 3.3meg	3973-230-2	
K3	IF-Limiter Circuitry	100mmf, 100mmf, 1000Ω, 1000Ω, 10K, 15K, 47K	3973-230-3	
K4	Discriminator Net	100mmf, 270mmf, 470mmf, 10000mmf, 33K, 33K, 100K, 100K, 1meg	3973-230-4	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ERIE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Trans.	236						
L2	RF Choke	240	19-1002	19-1002	BC-563	4606		2.4uh
L3	FM RF Coil	237						
L4	FM Mixer Coil	237						
L5	Cathode Choke	241						2uh
L6	FM Osc. Coil	238						
L7	RF Choke	240	19-1002	19-1002	BC-563	4606		2.4uh
L8	Loopstick	242			BC-418			
L9	AM Osc. Coil	239						
L10	1st FM IF Trans.	231	16-3490	16-3490		1463-PC		
L11	1st AM IF Trans.	235	16-6786	16-6786	BC-356	13-PC-1		
L12	2nd FM IF Trans.	232	16-3490	16-3490		1463-PC		
L13	2nd AM IF Trans.	235	16-6787	16-6787	BC-356	13-PC-2		
L14	3rd FM IF Trans.	233	16-3490	16-3490		1463-PC		
L15	Discriminator	234	17-3491	17-3491		1464-PC		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ERIE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .3A	125V @ .040A	6.3V @ 2.4A	244				PA8421		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ERIE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.040A	296 *	RS065 *	1234AH *	65 *	SR200 ♦	* Selenum Type ♦ Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	ERIE PART No.	NOTES
M2	Tuning Cap.	292	5 Gang
M3	Switch	294	Band Selector
	Printed Board	3973-221	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	2120	Tuning
Knob	2121	Switch

WIRING DATA

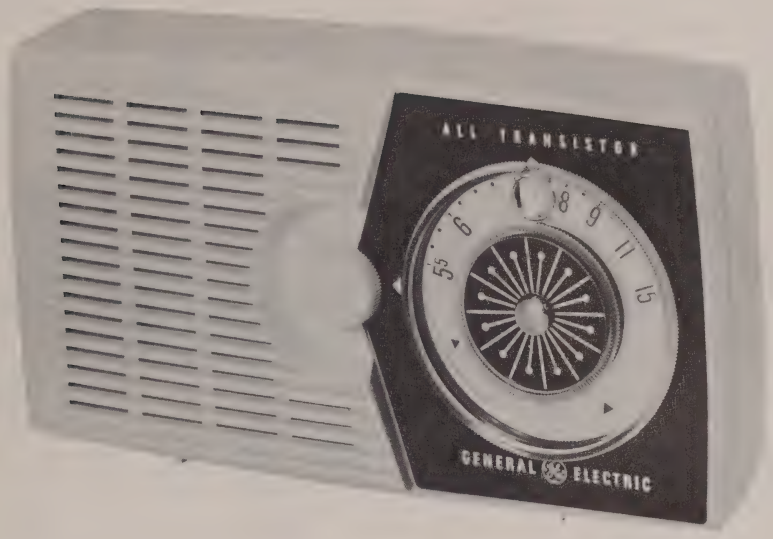
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODEL P800A

GENERAL ELECTRIC
MODEL P800A



GENERAL ELECTRIC
MODEL P800A

TRADE NAME	General Electric Model P800A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
RATING	18 MA@6 Volts DC
TUNING RANGE—BROADCAST	535 -- 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A6..... GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A4, A5..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	1400KC	Tune to 1400KC signal.	"	A5	"
4.	"	580KC	Tune to 580KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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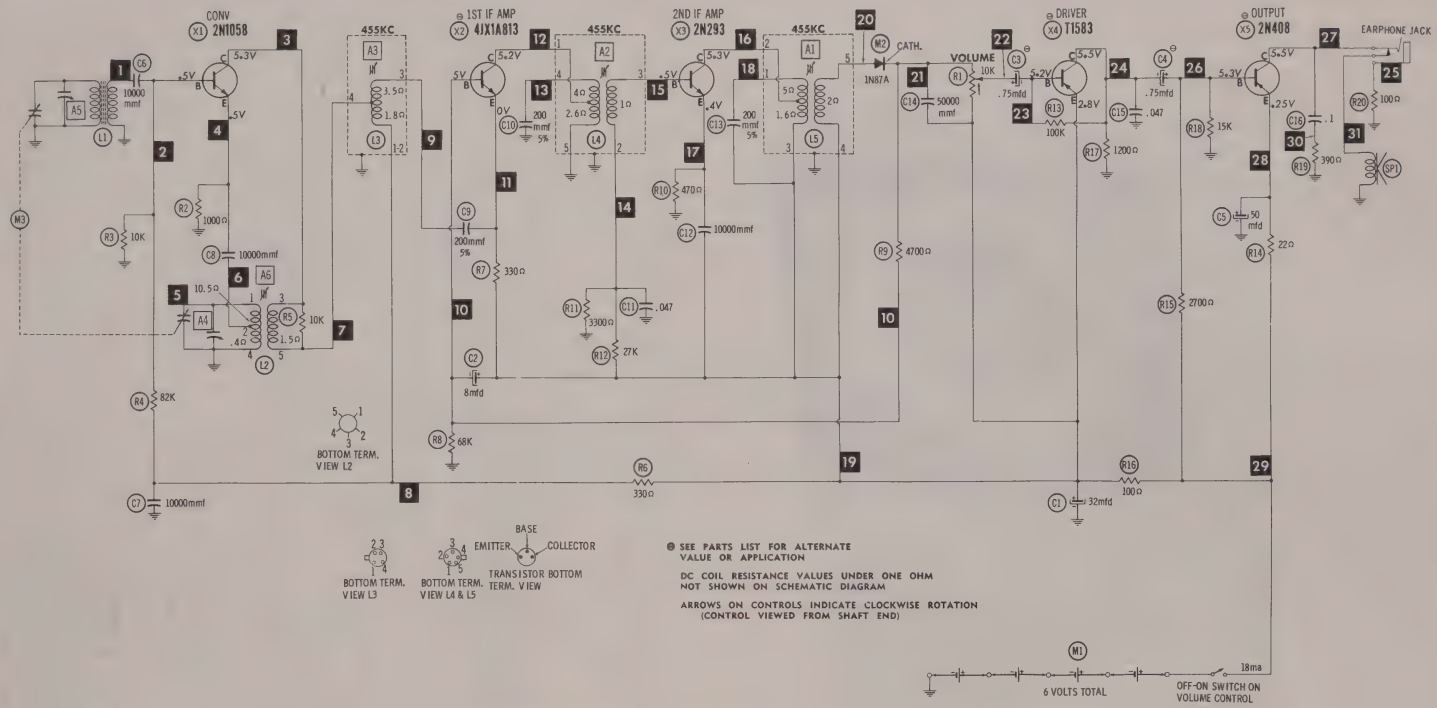
SET 482 FOLDER 10



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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GENERAL ELECTRIC MODEL P800A

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1058	Converter	2N438		2N1366		NPN
X2	4JX1A813¶	1st IF Amplifier	2N439		2N1367	2N94	PNP
X3	2N293	2nd IF Amplifier	2N439		2N1367	2N94	NPN
X4	T1583 ♦	Driver			2N362		PNP
X5	2N408 ‡	Output		2N408	2N631	2N408	PNP

* Some versions may use 2N410 or GT760R. Replace with same type as original.
♦ Some versions may use 2N408, or 4JX1E825. Replace with same type as original.
‡ Some versions may use 2N241. Replace with same type as original.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	32	10	RS-2146	PWE10030	EC30-15	TT15X30	ML30-15	TE-1132	
C2	8	6	RS-1462	PWE6008	EC8-6	TT6X8	ML8-6	TE-1086	
C3	.75	50	①	PWE50001		TC31	ML1-50	TE-1300	
C4	.75	50	①	PWE50001		TC31	ML1-50	TE-1300	
C5	50	10	RS-1047	PWE10050	EC50-10	TT10X50	ML50-15	TE-1119	

① Some versions may use .75mfd@12 V in this application (Part #RS-2083).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	200 5%		1469-0002	TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-32
C10	200 5%		1469-0002	TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-32
C11	.047 50V		V84C2S47	DD-503	STM1S47	IDP-2-473	TA-150	2WF-S47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	200 5%		1469-0002	TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-32
C14	50000		BPD-05	DD-503	H-05S50	IDP-2-503	TA-150	5HK-S50
C15	.047 50V		V84C2S47	DD-503	STM1S47	IDP-2-473	TA-150	2WF-S47
C16	.1 50V		V84C2P1	DDA-104	STM1P1	IDP-3-104	TA-010	2WF-P10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	10K	1/4	RS-2145					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1000Ω	
R3	10K	
R4	82K	
R5	10K	
R6	330Ω	
R7	330Ω	
R8	68K	

ITEM No.	RATING	REMARKS
R9	4700Ω	
R10	470Ω	
R11	3300Ω	
R12	27K	
R13	100K	
R14	22Ω	
R15	2700Ω	

ITEM No.	RATING	REMARKS
R16	100Ω	
R17	1200Ω	
R18	15K	
R19	390Ω	
R20	100Ω	

PRINTED BOARD

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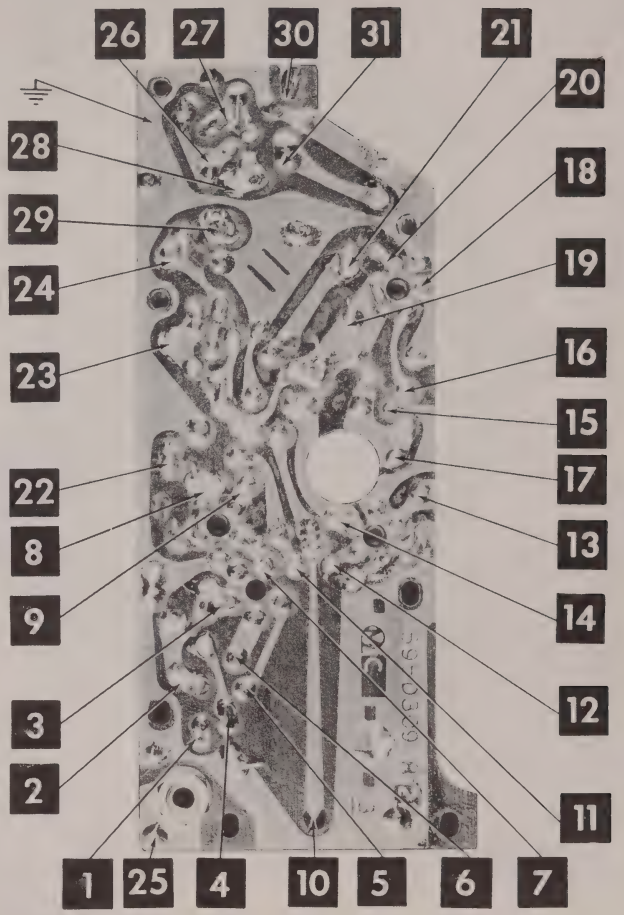


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		G. E. PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	RS-2142						
L2	Osc. Coil	RS-2141						
L3	1st IF Trans.	RS-2138						
L4	2nd IF Trans.	RS-2139						
L5	3rd IF Trans.	RS-2140						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	E. M.J.M.P.	G. E. PART No.	QUAM PART No.	
SP1	2 3/4"	EM	300Ω@ 1000~	RS-2143		

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			Z	1015			M-15R	4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		G. E. PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N87A	RS-1811	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Tuning Cap.	RS-2144	2 Gang; Ant. 12–128mmf, Osc. 11–87mmf

CABINETS & CABINET PARTS

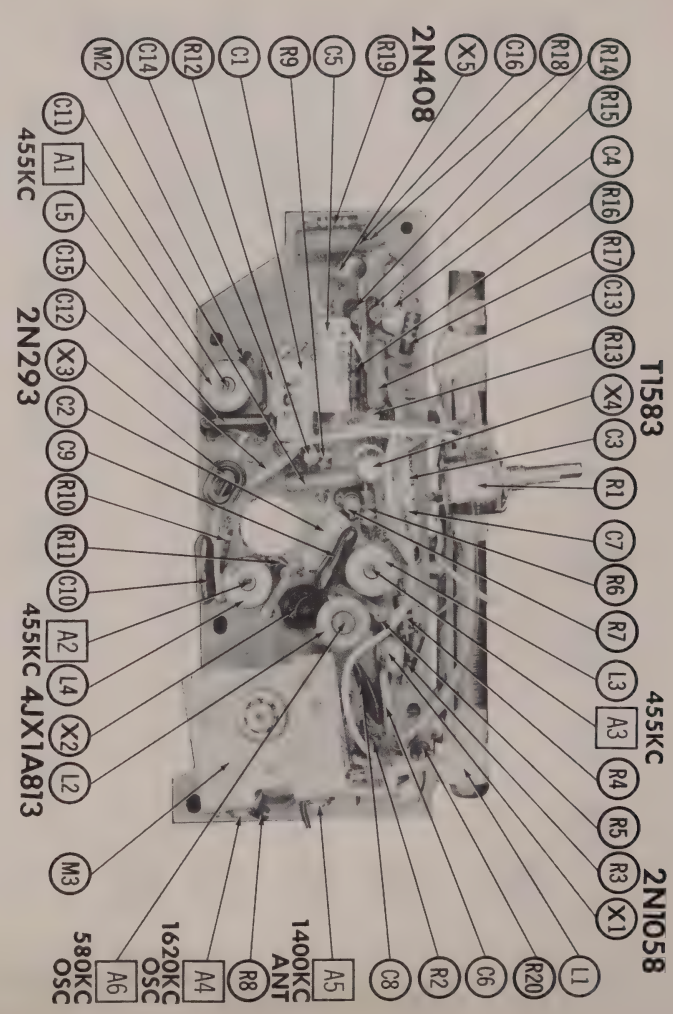
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-2131	Tuning
Knob	RS-2134	Volume
Cabinet Ass'y.	RB-1114	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder

GLASER-STEERS MODEL GS-77 (Revised)

GLASER-STEERS MODEL
GS-77 (Revised)

GLASER-STEERS MODEL
GS-77 (Revised)

GENERAL INFORMATION

Glaser-Steers Model GS-77 Revised Stereo/Monaural Record Changers are designed to play in automatic sequence a stack of records and shut off after playing the last record.

The Glaser-Steers Model 77 Turntable pauses during change cycle. It resumes motion only after next record has come in to play position, and stylus is in lead-in grooves of record.

The sound output is muted, during change cycle.

Record separation is accomplished by movement of a finger in the center spindle. This finger directly separates records having a 1/4" centerhole.

Connect this changer to an outlet supplying 117 volts, 60 cycle AC only, unless otherwise specified.

MANUFACTURED by:

Glaser-Steers Corporation
155 Oraton St.
Newark 4, N. J.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

C427

SET 482 FOLDER 11

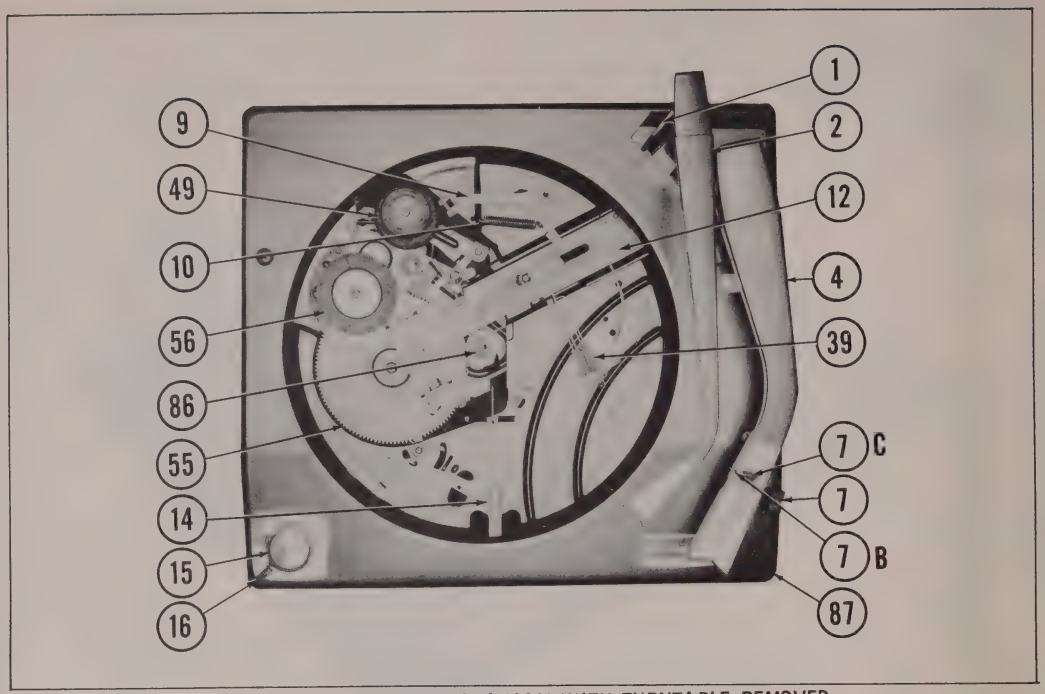


FIG.1 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

CONTROLS

Two controls are provided on the baseplate. Both are on the left front corner.

The bottom control is the "On-Off-Reject" control. Turning this control counterclockwise causes the tone arm to lift off the record, then return to the rest post. The mechanism will then shut off automatically.

Turning this control clockwise to the "On-Reject" position energizes the motor, and starts the mechanism in to cycle. The mechanism will shut off automatically after the last record has been played.

The top control is the "Speed Selector" control. By leaving the "Speed Selector" control in "Auto-Brain" position, you may play automatically all records (except 16 r.p.m.) without resetting the "Speed Selector". You need only select the proper stylus:

7, 10 and 12" records of both 33 and 45 r.p.m. speed may be intermixed in any order. They play at proper speeds. Be sure you use "33-45" stylus (LP, MG).

78 r.p.m. records of all sizes may be intermixed and will play at proper speed. Be sure you use "78" (Std.) stylus. This feature only applies to cartridges that have a turn-over lever correctly located to enter rest post opening when 78 stylus is in position or when 78 wand is mounted on cartridge bracket as called for on cartridge mounting instruction sheet received with changer.

OPERATING INSTRUCTIONS

Operating With Selector Control At "Speed Minder"

1. Lift and move balance arm to the right. Then place 45 r.p.m. records (with center inserts), or 33 r.p.m. records, or both speeds intermixed on spindle; return balance arm and lower on top record.

2. After checking to be certain that 33-45 stylus is in play position, simply push "On-Off-Reject" control to "On" and release. (The changer will now automatically play all records you have loaded and will shut off after the last record.)

3. To play 78 r.p.m. records by "Speed Minder", simply be sure that when you load 78 r.p.m. records on spindle, stylus is in 78 position. Then push "On-Off-Reject" control to "On". This applies to certain cartridges only. Otherwise, simply dial 78 R.P.M. directly.

4. To reject a record, push "On-Off-Reject" control to "Reject" and release. To discontinue play, push control to "Off" and release.

Automatic Operation At 16 rpm

1. Set "Speed Selector" control at 16 r.p.m.

2. Turn stylus to 33-45.

3. Load records, lower balance arm, push control to "On".

Manual Operation

1. Move balance arm over rest post. Leave in that position during manual play. Place record on turntable. Set at speed desired.

2. Push operating control to "On". Tone arm will come in to 7" position. Move tone arm back to rest post. (You may stop tone arm, if you prefer, just before it lands on record, and then move it to rest post and leave it there).

3. Now, check to be sure you have "Speed Selector" control set correctly for your record, and the proper stylus chosen. Set tone arm on any position on the record and play.

NOTE: In manual play, tone arm will not cycle after playing the record. However, if you wish changer to stop automatically after completion of the record, move balance arm over spindle, before lifting tone arm from rest post.

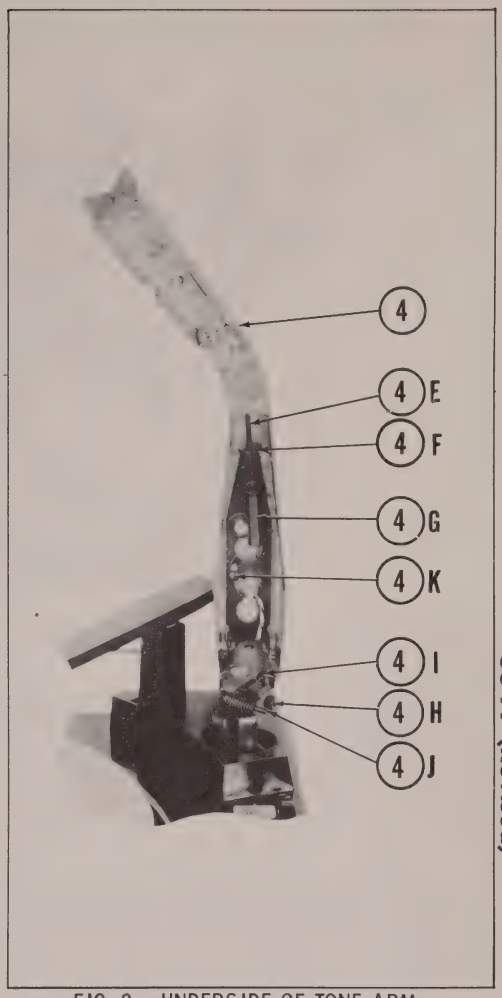


FIG. 2 UNDERSIDE OF TONE ARM

ADJUSTMENTS

Stylus Pressure Adjustment

Knurled nut (4F) for adjusting stylus pressure is located slightly to the rear of the tone arm center. With tone arm in horizontal position turn nut from right to left to reduce pressure; and from left to right to increase pressure. Adjust to pressure recommended for your cartridge.

Set-Down Adjustment

By lifting tone arm upward about 1" from rest post, set-down adjusting screw (4J) becomes accessible under rear of tone arm. Using any size record, adjust so that stylus comes to rest on the lead-in grooves. Turning screw (4J) clockwise moves stylus away from center.

Tone Arm Height Adjustment

By pivoting tone arm to an almost vertical position, height adjustment screw (4K) is visible. Tone arm height should be set so that the bottom edge of tone arm clears highest point of rest post shelf by approximately 1/8 inch.

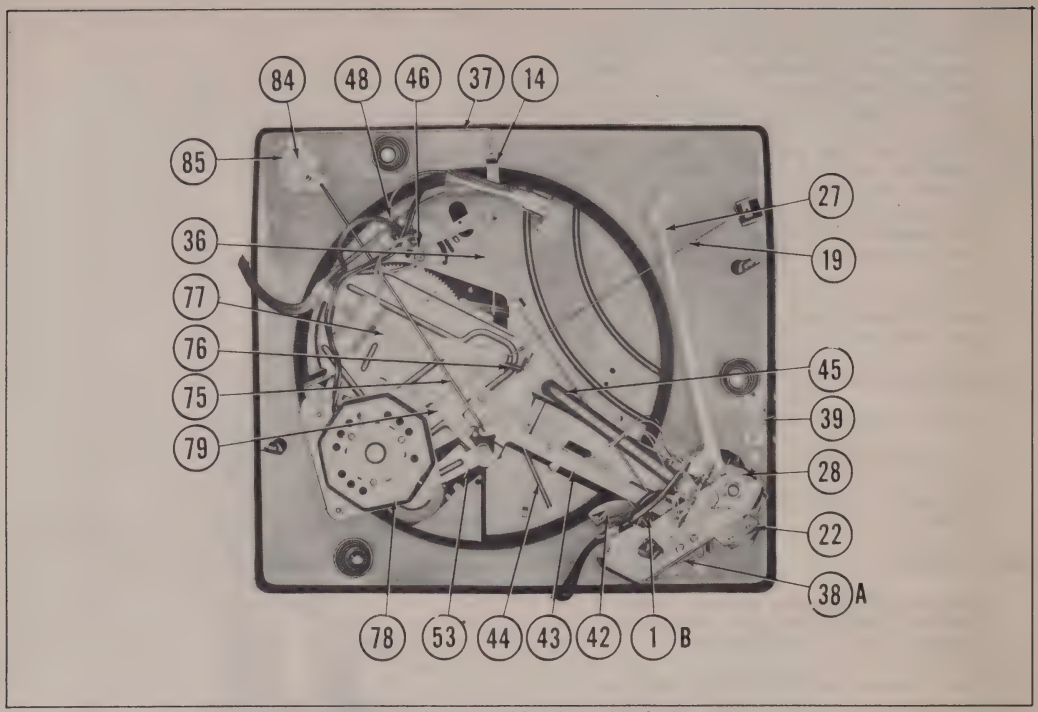


FIG.3 BOTTOM VIEW OF MECHANISM

CHANGE CYCLE

Observe the change cycle operation by removing turntable and turning changer on, or by manually rotating the cycling gear (55) counterclockwise. The action described below can then be readily followed and each part's function more easily understood.

This changer has a "Velocity Trip" mechanism. Change cycle is started by the fast inward motion of the tone arm when the needle enters leadout grooves at the end of a record.

Tone arm hinge assembly and velocity trip arm (27) are secured together so they move in unison. While a record is playing, the slight movement of velocity trip arm (27) is not sufficient to trip the mechanism because the wiping action by velocity trip washer (50) moves velocity trip arm (27) back with each revolution of the turntable.

In the first revolution of the turntable, as the tone arm advances rapidly toward the spindle, velocity trip arm (27) is moved fast enough and far enough to engage velocity trip washer (50). Contact between velocity trip arm (27) and velocity trip washer (50) gives the necessary lift to force cycle control lever (58) out of engagement with driver pinion arm (59). Driver pinion arm (59) by action of driver arm spring (60), brings driver pinion wheel (56) into engagement with the motor pulley, supplying driving force to cycling gear (55). As the cycling gear (55) rotates, main slide (12) moves to the left thru the action of the eccentric mounted pin on cycling gear (55) riding in the cross slot on the main slide assembly (12).

As main slide (12) begins to move, cam (12A) (part of main slide) will cause tone arm index cam (21) to move down. This pulls the back part of the tone arm hinge assembly (20) down, lifting the front part of the tone arm up and off the record. Projection (12B) on rear of main slide (12) now comes in contact with safety spring (25), forcing the spring forward. Safety spring (25), tone arm hinge assembly (20), and tone arm index cam (21) are secured together so they move in unison. The action of safety spring (25), tone arm hinge assembly (20), and tone arm index cam (21) pivot the arm toward rest post (7).

As the tone arm moves toward the rest post, spindle actuating crank (83), attached to bottom part of cycling gear (55) has rotated far enough to actuate spindle slide (77), moving it to the left. Spindle slide (77) actuates the spindle, dropping one record on the turntable. During the record drop, turntable (5) does not revolve, due to the braking action of brake lever (9) actuated by the main slide (12).

At about the same time, index finger (1) moves forward by action of the main slide (12) moving away from the index finger. As the record drops to the

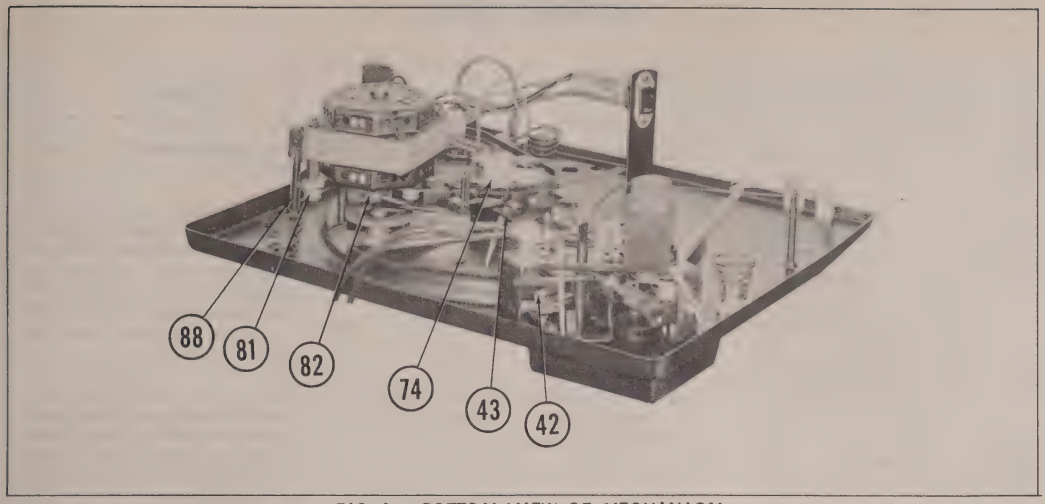


FIG.4 BOTTOM VIEW OF MECHANISM

turntable, the record either strikes or misses index finger (1), depending on the size of the record. In the case of a 7 inch record, the record completely misses the index finger (1). This causes pawl catch assembly (42) to be caught in the first notch, which in turn places index pawl (40) in the first notch of tone arm index cam (21). The tone arm will now move out to the 7 inch set-down position. In the case of a 10 inch record, the record strikes the index finger (1) just enough to move the index finger (1) to the next series of notches. The tone arm will now move out to the 10 inch set-down position. The 12 inch record acts the same as described above, except the third series of notches comes into contact. The tone arm will now move out to the 12 inch set-down position.

As the main slide (12) reverses direction of travel, the extension spring (ratchet spring) attached to tone arm index cam (21) will move the tone arm out over the record. About this time, tone arm index cam (21) moves up cam (12A). This action places the tone arm down on the lead-in groove of the record. Cycling gear (55) now rotates to its out of cycle position, allowing the tone arm to move freely across the record.

After the mechanism has been tripped, it again follows the proceeding sequence of cycling and playing the records, until the last record of the stack has been played.

As the last record of the stack drops to the turntable, balance arm (2) drops below the off-set shelf on spindle assembly (86). Lower end of balance arm (2) drops below the offset shelf on spindle assembly (86). Lower end of balance arm (2) contacts shut-off wire (36), forcing it downward. The shut-off wire (36) holds stop catch pawl (41) up; stop catch pawl (41) drops, thus blocking pawl catch assembly (42) and causing index pawl assembly (40) to move inward to catch the last notch on tone arm index cam (21). This action will allow the tone arm to come to the rest post and remain there. The tone arm is held from moving in by action of index cam (21). Being in the last notch, control slide assembly (43), attached to index cam (21), is stopped from moving towards the right. When control slide assembly (43) fails to move, shut-off pivot (67) remains in the up position, holding switch lever assembly (46) up and in contact with the projection on the bottom of cycling gear (55). As the projection on the cycling gear (55) strikes switch lever assembly (46), power is removed from the motor and the mechanism stops.

TROUBLE CHART

Symptom	Cause	Remedy
1. Changer does not function when control is turned to "On-Reject" position.	1. No power to motor.	1. Check to see that AC current is reaching motor. Check wiring connection at switch and motor.

Symptom	Cause	Remedy
	2. Line voltage too low.	2. Line voltage must be at least 105V.
	3. Cycle of mechanism not complete.	3. Remove snap ring that secures turntable on record spindle. Remove turntable by lifting it straight up. Turn cycling gear (55) with crank pin in counter-clockwise direction till crank pin is in line with notch in main slide.
	4. Foreign lubricant on rubber tire (single tire wheel) that cycles changer.	4. Remove turntable and clean tire (56) with lint free cloth moistened with alcohol. Also clean motor shaft (49), wheel with 2 rubber tires, and inside of turntable rim.
	5. Bent switch lever assembly (46).	5. Both legs of switch lever (46) that project upward through base plate should be straight up and down and parallel to the center shaft of piece. Bend legs to correct position if necessary.
2. "On-Off" control cannot be turned to "On-Reject" position.	1. Cycle of mechanism not complete.	1. Follow same procedure as given in 1-3.
3. Changer will cycle and tone arm will come in to playing position but turntable will not rotate.	1. Turntable idler wheel (49) not engaging motor shaft and turntable.	1. Check spring (82) on idler arm (53) to be certain that idler is being pulled toward the direction of motor shaft.
	2. (When switching speeds manually only). Excessive friction between cam (74) and pin that raises and lowers idler arm (53).	2. Lubricate top surfaces of steps on cam (74) that raises and lowers idler arm (53).
4. Turntable speed too slow or large variations in turntable speed.	1. Improper line voltage.	1. Line voltage should be between 105 and 130 volts.
	2. Oil or grease on turntable idler, motor shaft, or turntable.	2. Wash all surfaces that contact each other with alcohol. Be sure to wash all diameters on motor shaft.
	3. Binding in turntable.	3. With changer shut off, check freedom of turntable rotation by spinning it by hand. Turntable must coast freely for a considerable length of time. If binding or roughness occurs, remove the turntable, clean bushing and spindle surfaces and relubricate with light oil. Check turntable thrust bearing for any foreign matter, clean and relubricate with light oil.
	4. Misalignment between turn-	4. Check alignment of turntable

Symptom	Cause	Remedy
	table idler (49) and diameters on motor shaft pulley.	idler (49) and pulley diameters on motor shaft. Starting with the 78 R.P.M. position (largest diameter on motor pulley) and switching speeds from 78 to 16 R. P. M. the idler must raise and contact the respective diameters on the motor without touching any of the diameters below. If idler arm is bent (should be parallel to motor plate 70), straighten arm till alignment above is achieved. Fiber spacer washer on idler shaft can also be relocated above or below idler wheel to vary height of idler as needed.
	5. Idler wheel assembly (49) binding on its shaft (53) and not rotating freely.	5. Place a drop of light oil at top and bottom of idler wheel shaft. Check that there are not too many fiber spacers on idler wheel shaft (53) causing binding between idler wheel and retaining ring on shaft. If so, remove one at a time until free.
	6. Pinion-driver wheel(56) does not fully withdraw from motor shaft at end of change cycle, causing drag on motor.	6. Check cycling gear (55) to see that crank pin is fully in notch of main slide (12). If not, due to excessive friction of main slide, relubricate moving contact points of main slide and main gear. Check that notch on main slide (12) does not have burr holding back crank pin of cycling gear (55) from locking in final position. Remove burr by filing carefully.
	7. Anti-skate wire (90) (silver wire running along side of main slide (12) from area near spindle (86) back to area of index-tone arm bracket (22) binding and continuing to be hit by spring (5A) on turntable hub after initial two revolutions of turntable.	7. Anti-skate wire (90) (silver wire)should be loose and easily moved clear of spring (5A) after turntable rotates twice. Adjust wire to loosen or clean off any lubricant causing sluggishness or tightness.
5. Difficulty in changing speeds manually.	1. Motor and switch wiring interferring with speed change cam rod (75).	1. Move all wires so that cam rod (75) is not restricted by them in any speed position.
	2. Idler arm (53) badly bent.	2. See procedure outlined under symptom 4, cause 4.
	3. Crank on arm shaft (84) interfering with motor board.	3. Check mounting of changer on motor board, making certain that the mounting springs are properly seated in the holes provided.
6. With speed control in "Speed Minder" position and stylus	1. Needle turnover lever is not moving pivot blade in rest	1. Adjust the cartridge in the tone arm so that the needle turnover

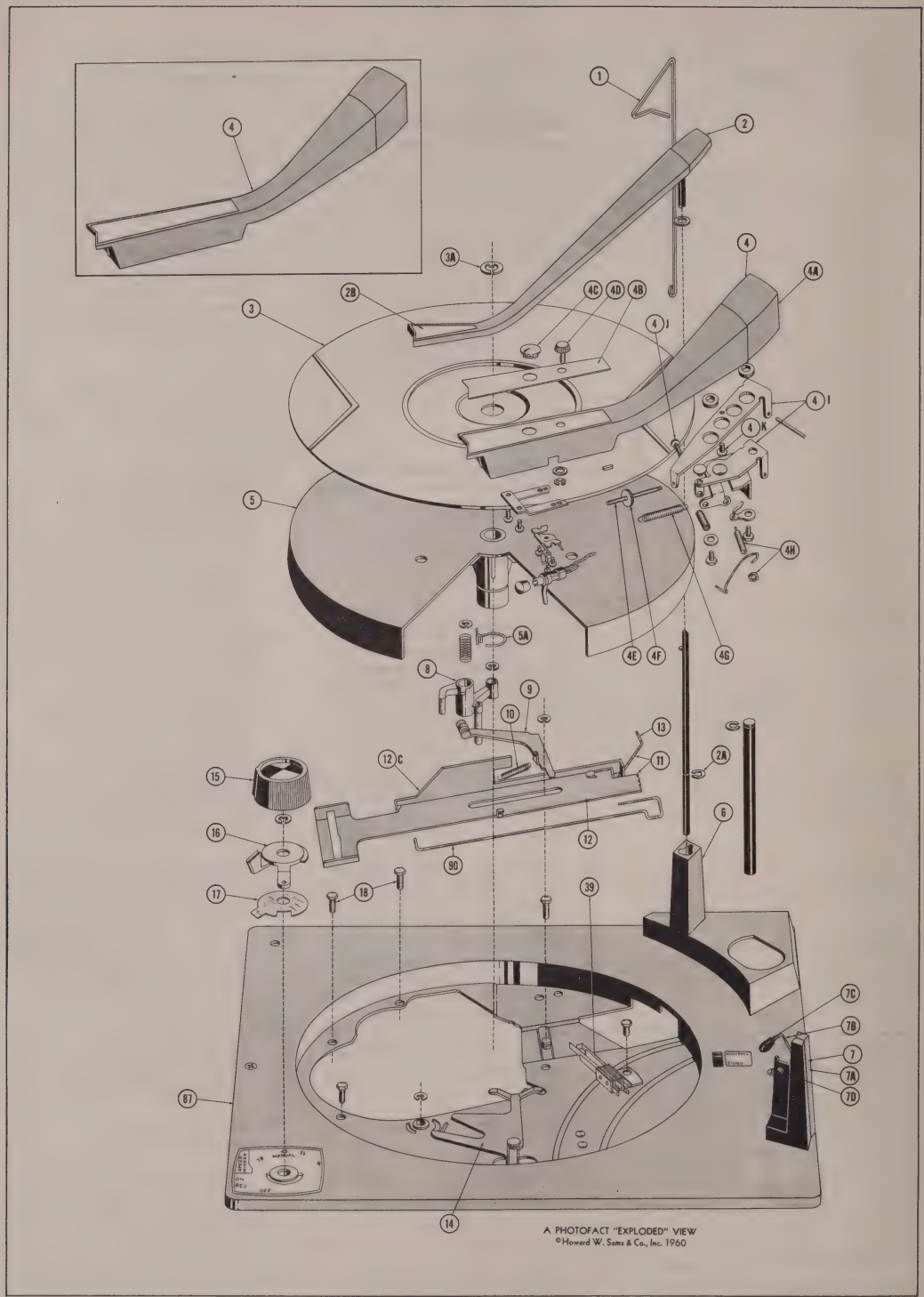


FIG. 5A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

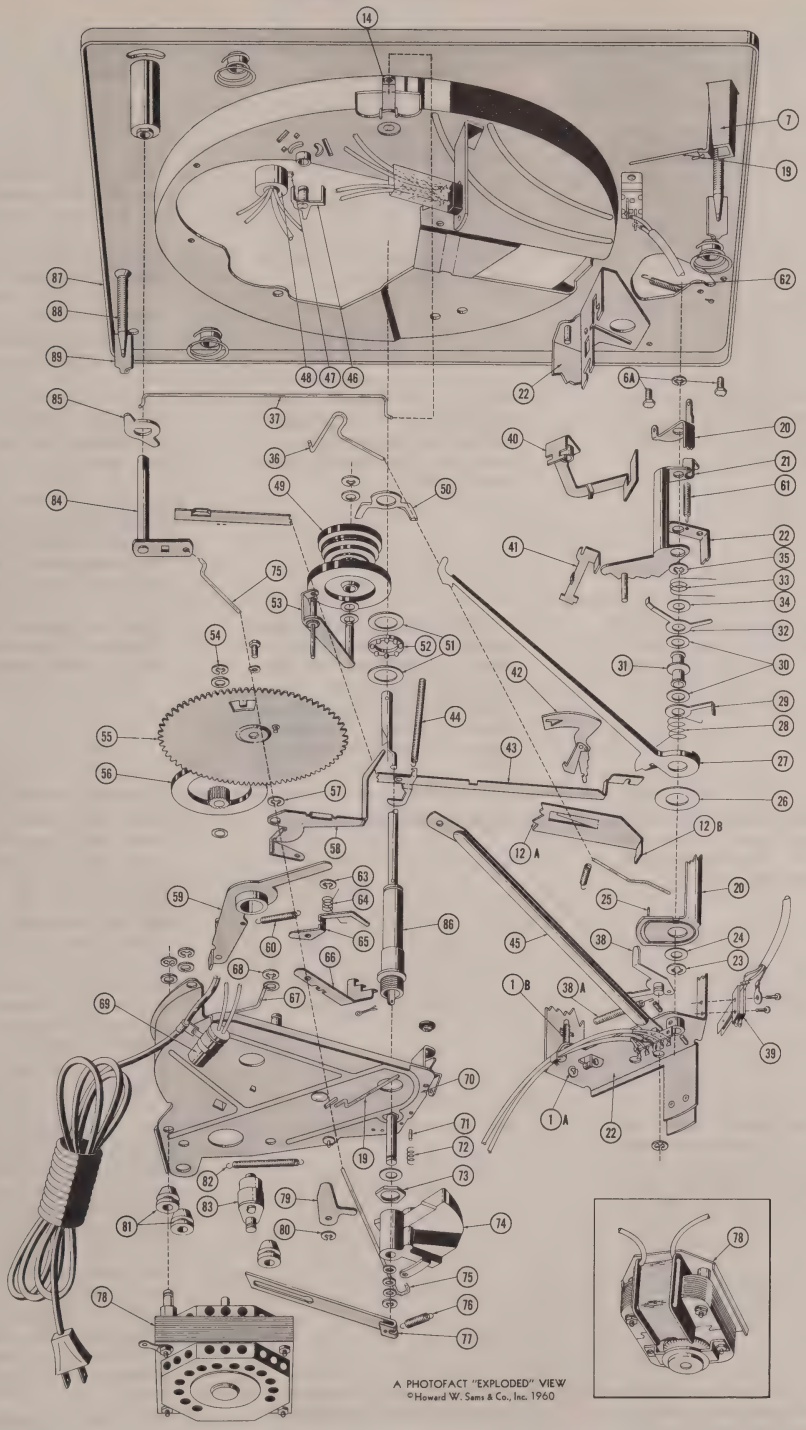


FIG.5B EXPLODED VIEW OF PARTS BELOW BASEPLATE

	Symptom	Cause	Remedy
	set at "78" or Std. play, turntable does not turn at 78 R. P. M.	post (7) far enough to set the mechanism for 78 speed.	lever projects at least 3/16 inch beyond the tone arm. Make sure the lever can enter the hole in the rest post without any interference.
		2. Cartridge incorrect type to provide this feature.	2. Use cartridge with turn-over arm that locates as in 6-1 or use 78 R. P. M. wand on cartridge bracket (see cartridge mounting instruction sheet received with changer.)
7.	With record balance arm over spindle, changer will not cycle when a record is finished playing.	1. Velocity trip arm (27), long narrow lever below changer that moves with the tone arm, is not reaching velocity trip washer (50).	1. Check to see that none of the power or cartridge leads are restricting the motion of the trip lever. The trip arm (27) is bent either too high or too low. The correct level of the free end should be in a range from 1/8 to 1/4 inch above the motor plate.
8.	Changer cycles by tripping through tone arm when operating in "Manual" position.	1. Velocity trip is not being blocked by triplock (38) located near the lower bearing hole of the balance arm shaft. This triplock (38) should bear under spring pressure against the balance arm shaft (2).	1. Refasten spring (42) between triplock (38) and vertical side of large bracket (22).
9.	Tone arm does not land at the beginning (lead-in grooves) of 7, 10, 12 inch records. (Set-down adjustment).	1. Improper adjustment.	1. The set-down adjustment screw (4J) is located at the front end of the tone arm bracket. It can be readily identified by the coil spring that surrounds it. Turning the screw head 1/2 turn in a clockwise direction moves the tone arm approximately 1/8 inch to the right (measured at the stylus). Adjust so that stylus lands approximately midway in the margin found at the beginning of all records.
10.	Tone arm does not drop sufficiently to play first record or tone arm interferes with records on spindle shelf during cycling.	1. Improper height adjustment.	1. The height adjustment screw (4K) is located in the bracket that mounts the tone arm. It is located midway between the 2 screws that secure the arm. One complete turn in a clockwise direction lowers the tone arm approximately 1/8 inch. Tone arm height should be set so that the bottom edge of tone arm clears the highest point of the rest post shelf by approximately 1/8 inch.
11.	With balance arm (2) raised, turning control lever to "On-Reject" position, tone arm	1. Improper height adjustment. 2. Improper set-down adjust-	1. See procedure under 10. 2. See procedure under 9.

	Symptom	Cause	Remedy
	will not leave rest post during cycle and upon completion changer shuts off.	ment.	
12.	Changer does not index for 10" records.	1. Improper interference between 10" record and index finger (1).	1. If tone arm comes in to 7" position instead of 10", this indicates insufficient interference between record and finger. Turn changer off and place a 10" record on the turntable. Bring the index finger by hand toward the spindle until completely forward. Raise the record along the spindle, keeping it parallel to the turntable. The record should interfere with nose of the index finger by approximately 3/32". The finger can be adjusted to this dimension by bending forward in the direction of the record. Do not overbend so as to exceed the 3/32" interference required. If tone arm comes in to 12" position instead of 10", interference between record and index finger is too great. Use same procedure as given above however bend the index finger in the opposite direction away from the record until proper interference is achieved.
13.	Changer repeatedly indexes for a 12" record.	1. Index finger (1) is not coming forward during cycle. Spring (1B) on finger below disengaged.	1. Refasten spring if disengaged.
14.	Changer drops 2 records at once.	1. Center hole in record too large.	1. Oversize holes will cause 2 records to fall at once.
		2. Small blade in upper portion of spindle (86) not fully down.	2. Straighten blade if bent so that it falls freely of its own weight. If not bent, clean slot and blade of any foreign matter and lubricant that may be present. Do not oil. Blade must fall freely by gravity.
15.	Changer will not shut off automatically after playing last record.	1. Balance arm (2) does not move to its full downward position.	1. Clean balance arm shaft and bearing holes of any foreign matter and lubricate with light oil. Arm must be free enough to fall downward by gravity. Clear any lead wires that may be interfering with the lower end of the balance arm shaft.
		2. Balance arm (2) does not push shut-off wire (36) down when it falls.	2. Look under changer at lower end of balance arm shaft. Large retaining ring (2A) must be in place and wire (36) must be below ring and contacting side of shaft.

Symptom	Cause	Remedy
	3. Tone arm index cam (21) does not catch pawl (40) at last or rest post position.	3. Loosen rest post (7) under changer base plate and move post away from turntable.
16. With balance arm up, changer will shut off after every cycle.	1. Lever (46) that operates power switch fails to fall to its downward position.	1. Clean shaft and bearing of switch lever of any foreign material. Wipe dry of any lubricant. Do not oil.
	2. Tone arm (4) does not leave rest post.	2. See procedure under 11.
17. Excessive low pitch noise (rumble) or thumping sound during record play.	1. Motor restrained from floating freely on rubber mounts.	1. Check to see that motor is not touching any part of cabinet. Clear any power leads that may be restricting the floating action of the motor.
	2. Damaged turntable idler (49).	2. If surface of rubber tire is not smooth or shows signs of distortion, idler (49) should be replaced.
	3. If power to changer is cut in mid-cycle and changer is left in this manner for any length of time, the rubber tires can develop a flat spot that will cause a thumping sound.	3. Run changer for at least 10 minutes. If thumping does not disappear, replace idler (49).
	4. Turntable bearing and/or idler wheel bearing is dry and rubbing.	4. Lubricate with light oil, same procedure as 4-3 and 4-5.
18. Tone arm does not track in record grooves.	1. Worn stylus in cartridge.	1. Replace.
	2. Improper tracking pressure for cartridge used.	2. Check tracking pressure for cartridge used and adjust to recommended value.
	3. Changer not level.	3. Relevel changer.
	4. Cartridge leads interfering with motion of tone arm.	4. Check to see that ample slack is provided in the tone arm leads so that the entire lateral travel of tone arm is not affected.
19. No sound during record play.	1. Defective cartridge.	1. Replace.
	2. Defective wiring.	2. Check cartridge leads for shorted or open leads.
	3. Loose cartridge terminal clips.	3. Remove clips from terminals squeeze slightly together and refasten to cartridge.
	4. Muting switch (39) out of adjustment.	4. Check to see that switch contact points operated by main slide have approximately 1/32" clearance when cycle is completed. If necessary, bend blade (32) that cams against main slide until this clearance is obtained. Cycle the changer

	Symptom	Cause	Remedy
			and check to see that contacts are touching after the main slide withdraws.
20.	Tone arm skates in over starting grooves.	1. Tone arm not level.	1. After changer is installed in operating position, permit the arm to hang freely between the rest post and the turntable, about 3/4" from turntable. Tap changer with finger. If tone arm remains stationary without swinging either way, the changer is level, and may be used immediately. If the arm swings to one side, merely raise the changer slightly on that side, or lower the other, until the arm remains at rest.
		2. Right angle bend on index pawl (40) damaged or bent less than 90 degrees.	2. Open right angle end of pawl (40), that engages with index cam (21), slightly with pliers. Do not open to more than 93 degrees. You should then re-adjust indexing and muting switch. See No. 19-4 and 9-1.
21.	Tone arm goes to 10 inch position when playing 7 inch records.	1. Index finger (1) does not come all the way forward.	1. Shorten the length (by bending) of the extended end of spring (13) attached to main slide. This will allow the finger to move completely forward before it is caught by the pawl.
22.	Changer will not shut off when turning lever to "off".	1. See No. 15-2 & 15-3.	1. See No. 15-2 & 15-3.
		2. Shut-off pivot (67) that lifts power switch shut off lever (46) does not raise the lever high enough or raise it at all.	2. Unexposed end of rod is under cycle control slide (43). Remove slide and replace with rod resting on top of slide. Bend end of shut off lever (46) (under gear) upwards so that lanced tap on gear (55) will engage the lever.
		3. Off lever (16) snaps back too rapidly causing shut-off wire (36) to bounce back into "on" position.	3. Turn on-off lever (16) to off with normal, steady movement. Do not snap off rapidly.
23.	Spindle will not drop last record (or a record).	1. Balance arm (2) not holding records parallel to turntable.	1. Twist or bend the balance arm slightly in the required direction so that the records are supported parallel to the turntable.
		2. Record Push-off fingers of spindle (86) not retracting within the spindle diameter.	2. Hold ends of blades under motor base, and bend these fingers back, so they fall inside the diameter of the top portion of spindle and clear the shelf.
24.	Erratic Indexing.	1. Tone arm mount assembly (41) is loose. This pivot is	1. Loosen nut, tighten screw gently then back off 1/8 turn

Symptom	Cause	Remedy
	the small screw with lock nut located under right rear side of tone arm.	and tighten nut. Be sure point of screw is in socket of pin and that point on opposite end of pin is in hole of bracket. Do not over tighten as this will cause excessive vertical friction. When properly adjusted, the vertical friction is less than 1/2 gram.
25. Motor has whining, airbourne noise when running.	1. Self-aligning motor bearing jarred out of place in shipping.	1. With motor running under power, sharply tap motor laminations with blunt instrument (such as a plastic screwdriver handle) a few times until noise disappears.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	11411-1	Index Finger
1A	1424-SP-18	Retaining Ring for Index Finger
1B	12926-12	Index Finger Spring
2	5709-501	Balance Arm Assembly
2A	1424-SP-21X	Balance Arm Retaining Ring
2B	B	Balance Arm Trim Plate
3	13403-2	Rubber Mat
3A	1424-SBO-X43	Turntable Retaining Ring
4		Tone Arm Assembly (consists of:) GS-77
4A	13406	Tone Arm
4B	12950-7	Tone Arm Trim Plate
4C	11841-1	Tone Arm Plug Button
4D	10220-1	Knob
4E	10215-1	Stylus Pressure Screw
4F	10213-1	Stylus Pressure Nut
4G	12926-14	Stylus Pressure Spring
4H	5705-508	Pivot Screw & Nut Assembly
4I	5710-503	Tone Arm Mount Assembly
5	5708-502	Turntable Assembly (GS-77)
5A	11420-1	Spring
6	13401-1	Balance Arm Support
6A	1021-10	Screws #6-38 (2)
7	5704-501	Rest Post Assembly
7A	13405-1	Rest Post
7B	11412-1	Lock, Tone Arm Hold Down
7C	11836-2	End Bumper, T.A. Lock
7D	11809-1BK3	Rivet
8	5702-510	Speed Control Arm Assembly

Ref. No.	Part No.	Description
9	5702-504	Brake Lever Assembly
10	12926-15	Brake Lever Spring
11	5702-503	Main Slide Assembly (consists of 12 & 13)
12	12478-2	Main Slide
13	11421-1	Main Slide Spring
14	12477-1	Control Lever
15	12307-2	Speed Knob (Brass Insert) (GS-77)
15	12307-3	Speed Knob (Chrome Insert)
15	12309-1	Speed Knob (All Chrome)
16	10151-1	On-Off Lever (Brass) (GS-77)
16	10151-2	On-Off Lever (Satin Chrome)
16	10155-1	On-Off Lever (Bright Chrome Plate)
17	11840-1	Acetate Washer
18	1021-11	Screws #6X3/16 (6)
19	11400-1	78 rpm Change Wire (Steel) (GS-77)
19	11400-3	78 rpm Change Wire (Copper Plate)
20	5710-505	Tone Arm Hinge Assembly
21	5702-507	Tone Arm Index Cam
22	5710-506	Index-Tone Arm Bracket Ass'y.
23	1423-SP-37	Retaining Ring
24	1023-9	Washer (Spring)
25	11406-1	Spring, Safety
26	1063-7	Washer (Plastic)
27	12482-1	Velocity Trip Arm

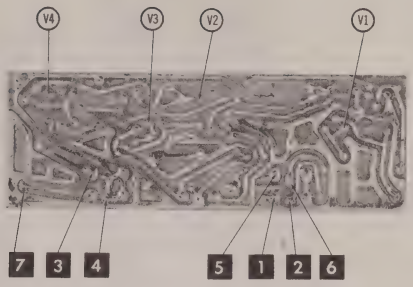
Ref. No.	Part No.	Description
28	11407-1	Spring Trip Arm
29	11011-2	Washer, Reset
30	1063-10	Washer (2)
31	10219-1	Bushing, Trip Arm
32	11035-1	Lever, Skate
33	11418-1	Spring
34	1063-7	Washer
35	1424-SBO-X43	Retaining Ring
36	12925-1	Shut-Off Wire
37	11401-1	Rod, On-Off
38	5702-505	Balance Arm Trip Lock Ass'y.
38A	12926-6	Trip Lock Spring
39	10022-1	Muting Switch (Under Turntable) (GS-77)
39	12973-1	Muting Switch (4-Wire) (GS-77)
39	12971-1	Muting Switch (3-Wire)
40	5702-506	Index Pawl Assembly
41	11007-1	Pawl, Stop Catch
42	5702-508	Pawl Catch Assembly
43	5712-505	Control Slide Assembly
44	12926-7	Spring, Extension
45	11029-1	Brace
46	5702-501	Switch Lever Assembly
47	11801-3	Power Switch
48	11801-2	Shield, Power Switch
49	13005-1	Idler 2-Pole 60 Cycle
49	13005-2	Idler 4-Pole 60 Cycle (GS-77)
49	13005-3	Idler 4-Pole 50 Cycle (GS-77)
49	13005-4	Idler 2-Pole 50 Cycle
50	12475-1	Velocity Trip Washer
51	11804-2	Thrust Washers, Spindle (2)
52	11804-1	Ball Bearings, Spindle
53	5702-511	Idler Arm Assembly (4-Pole) (GS-77)
53	5702-512	Idler Arm Assembly (2-Pole)
54	1424-SP-11X	Retaining Ring
55	5703-502	Cycling Gear Assembly
56	10001-2	Pinion-Driver Wheel

Ref. No.	Part No.	Description
57	1423-SP-18	Retaining Ring
58	13701-1	Lever, Cycle Control
59	5703-510	Driver Pinion Arm Assembly
60	12926-2	Spring, Driver Arm
61	12926-8	Spring
62	12926-16	Spring
63	1424-SP-15	Retaining Ring
64	11408-1	Spring, Speed Stop
65	11013-1	Reset, Speed Stop
66	11003-1	Stop, Speed Control
67	11402-1	Pivot, Shut-Off
68	1424-SP-18X	Retaining Ring, Motor
69	12955-1	Click Filter, Motor
70	5703-509	Motor Plate, Sub-Assembly
71	10205-1	Pin, Detent.
72	12927-2	Spring, Compression
73	1296-5	Nut, Spindle
74	12303-1	Cam, Shift
75	11403-1	Rod, Cam
76	12926-20	Spring, Spindle Slide
77	11000-1	Spindle Slide
78	13004-2	Motor 4-Pole (GS-77)
79	11014-1	Lever, Change
80	1424-SP-12	Retaining Ring
81	10152-1	Grommet, Motor Mount
82	12926-1	Spring, Idler Wheel
83	5703-503	Crank, Spindle Actuating
84	5712-503	Arm-Shaft Assembly
85	11024-1	Stop, Speed Knob
86	12001-1	Spindle Assembly
87	5730-503	Base Plate Sub-Assembly
88	11805-1	Transit Mtg. Screw
89	11806-1	Clip, Transit, Mtg. Screw
90	11419-1	Anti-Skate Wire Rod
91	DL-5724-501	Cartridge Mtg. Bracket(Not Shown)
92	DL-5714-506	Cartridge Mtg, Kit (Not Shown)

PHOTOFACT® Folder with CIRCUITRACE*

OLYMPIC MODEL SP-59

OLYMPIC
MODEL SP-59



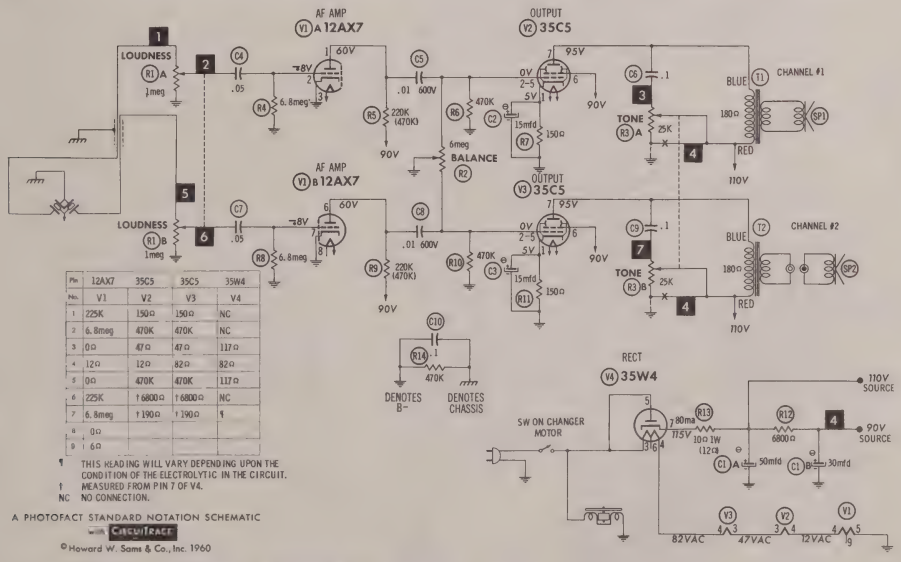
ARROWS INDICATING TUBE LOCATION ARE POINTING TO PIN 1

A Howard W. Sams CIRCUITRACE* Photo

TRADE NAME	Olympic Model SP-59
MANUFACTURER	Olympic Radio & TV Inc., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 31 Watts, .34 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11

OLYMPIC
MODEL SP-59



Pin No.	12AX7 V1	35C5 V2	35C5 V3	35W4 V4
1	225K	150Ω	150Ω	NC
2	6.8meg	470K	470K	NC
3	0Ω	47Ω	47Ω	117Ω
4	12Ω	12Ω	82Ω	82Ω
5	0Ω	470K	470K	117Ω
6	225K	†6800Ω	†6800Ω	NC
7	6.8meg	†190Ω	†190Ω	¶
8	0Ω			
9	60			

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 482 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆		RAYTHEON ◆ SYLVANIA ◆			
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7	V3	Channel 2 Output	35C5
V2	Channel 1 Output	35C5	V4	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	50	150	①	PRS2200	BBRD5315	TCD497	TDLD-8	TVA-2450	
B	30	150							
C2	15	12	②	XPP12015	NLW15-25	TT25X15	ML15-25	TE-1129	
C3	15	12	②	XPP12015	NLW15-25	TT25X15	ML15-25	TE-1129	

① C1 may be a 70-30mfd in some versions.
② Some versions may use 10mfd in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C5	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C6	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C7	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C8	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C9	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg							Loudness, Channel 1
B	1meg							Loudness, Channel 2
R2	6meg							Balance
R3A	25K							Tone, Channel 1
B	25K							Tone, Channel 2

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	6.8meg	(470K) *
R5	220K	
R6	470K	
R7	150Ω	

ITEM No.	RATING	REMARKS
R8	6.8meg	(470K) *
R9	220K	
R10	470K	
R11	150Ω	

ITEM No.	RATING	REMARKS
R12	6800Ω	(12Ω) *
R13	10Ω 1W	
R14	470K	

* Alternate Value

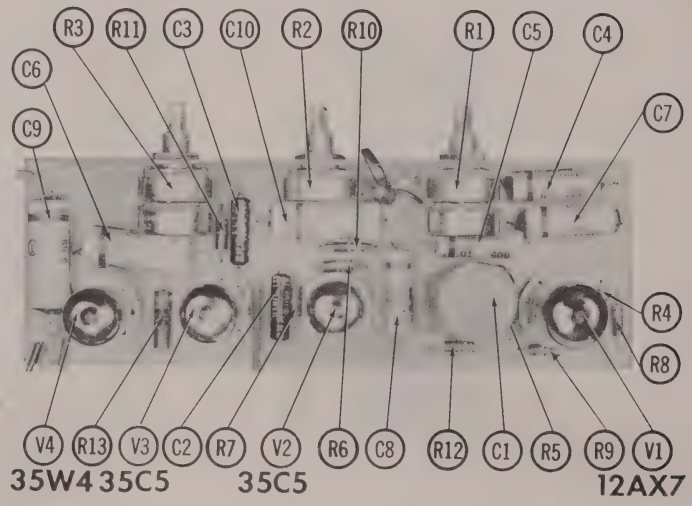
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	3-4Ω		22S45	A-2928	AU-603	A-3876	22S45	S-1X	
T2	2300Ω	3-4Ω		22S45	A-2928	AU-603	A-3876	22S45	S-1X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω		5A1	
SP2	5 1/4"	PM	3-4Ω		5A1	

CHASSIS—TOP VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	OLYMPIC PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		86-TS *	N7-7 N8-3	66 ‡	Not Req			3TA4-S *	N-8TA-S

* Includes Mount.
‡ Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	OLYMPIC PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78RPM)	W-64S † or W-64D ♦	CRA-55 † or CRA-55D ♦	† Jewel ♦ Diamond
	(LP)	W-64MGS † or W-64MGD ♦	CRA-55X or CRA-55XD ♦	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

RCA VICTOR MODEL PM14
(Ch. 2P24, 6P23)

RCA VICTOR MODEL PM14
(Ch. 2P24, 6P23)

RCA VICTOR MODEL PM14
(Ch. 2P24, 6P23)

TRADE NAME	RCA Victor Model PM-14 (Preamp. Ch. 2P24, Amp. Ch. 6P23)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 9 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 125 Watts, 1.3 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER RP205G-1A - SEE RCA VICTOR RP205 SERIES - PHOTOFACT SET 358 FOLDER 10 OR RECORD CHANGER MANUAL RC-10

SET 482 FOLDER 13

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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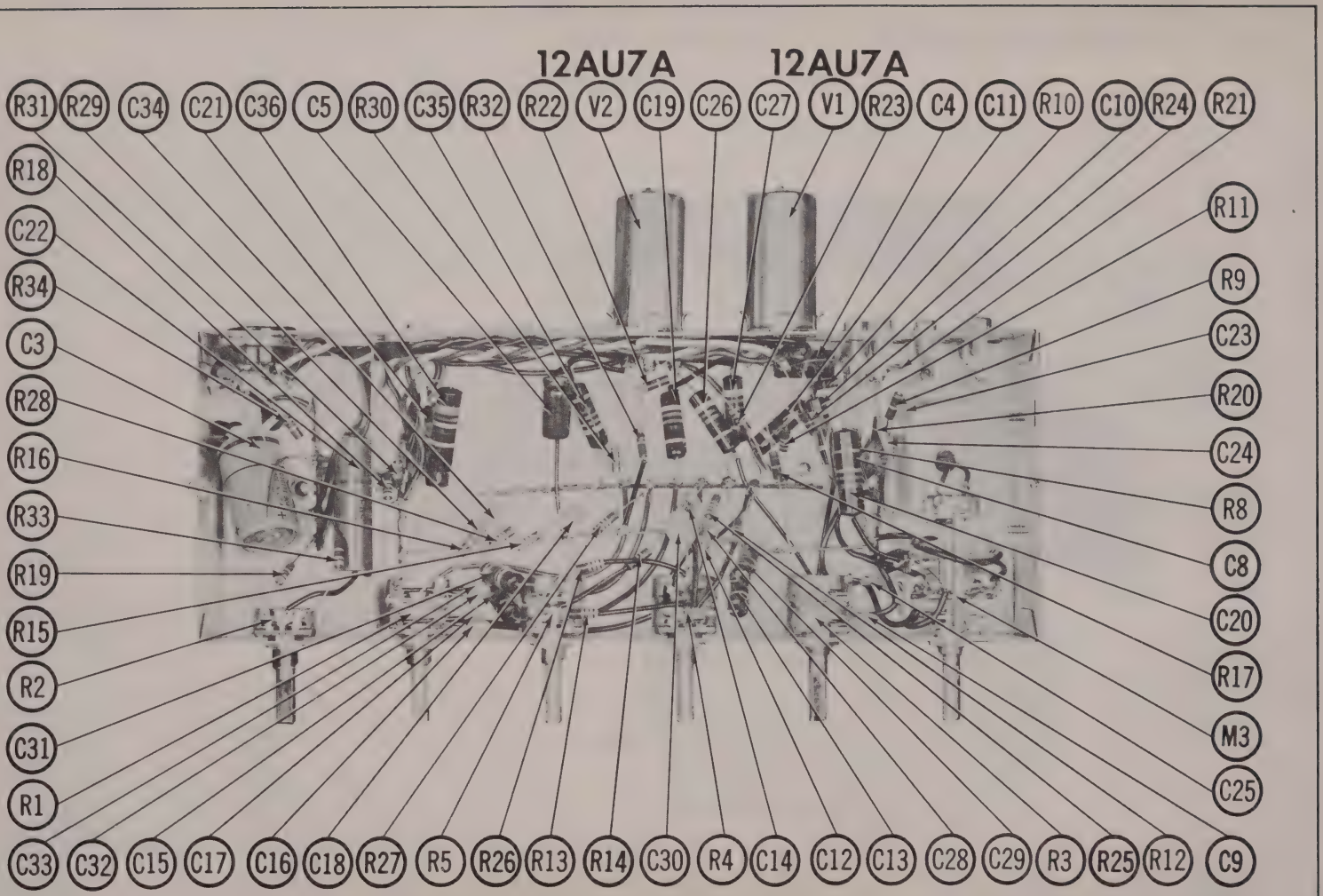
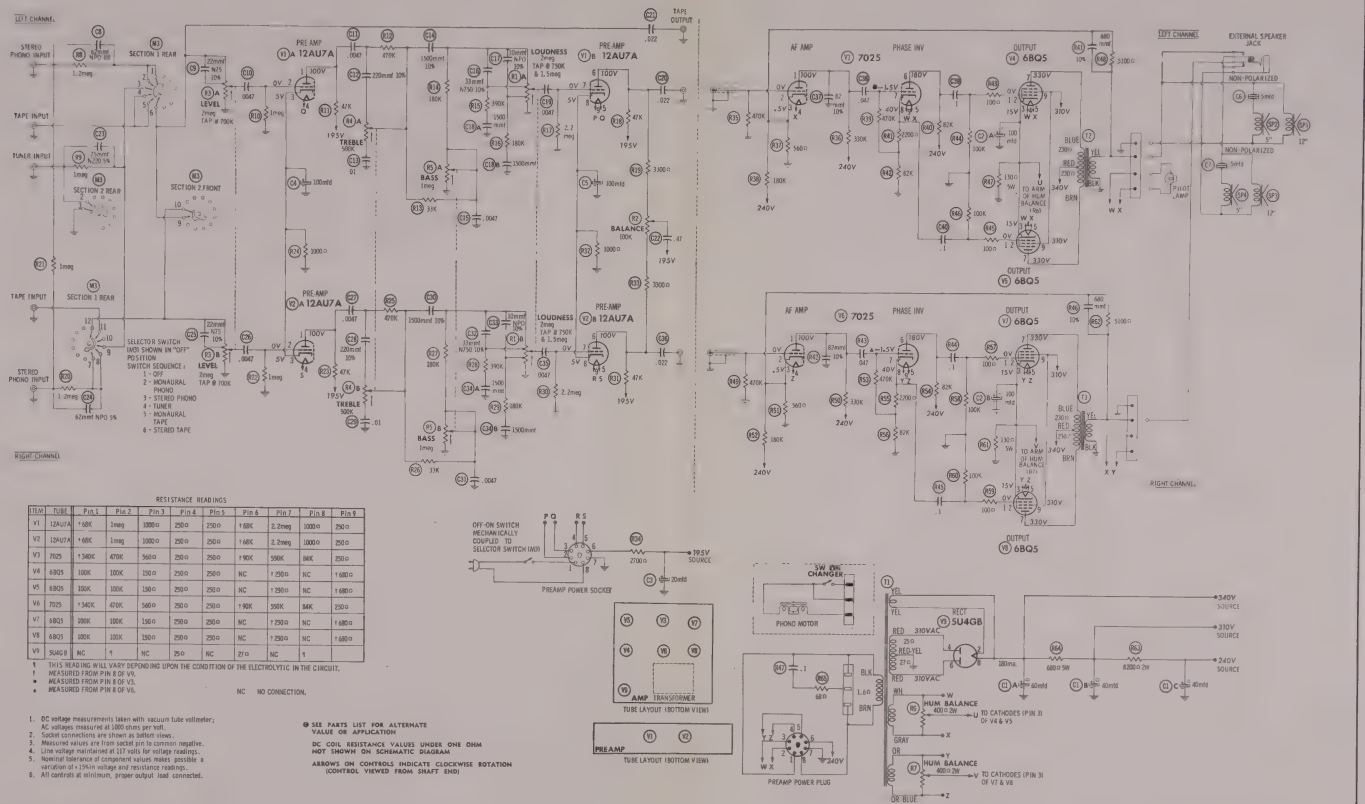
JT580



PREAMP. CHASSIS – BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	†68K	1meg	1000Ω	250Ω	250Ω	†68K	2.2meg	1000Ω	250Ω
V2	12AU7A	†68K	1meg	1000Ω	250Ω	250Ω	†68K	2.2meg	1000Ω	250Ω
V3	7025	†340K	470K	560Ω	250Ω	250Ω	†90K	550K	84K	250Ω
V4	6BQ5	100K	100K	150Ω	250Ω	250Ω	NC	†250Ω	NC	†680Ω
V5	6BQ5	100K	100K	150Ω	250Ω	250Ω	NC	†250Ω	NC	†680Ω
V6	7025	†340K	470K	560Ω	250Ω	250Ω	†90K	550K	84K	250Ω
V7	6BQ5	100K	100K	150Ω	250Ω	250Ω	NC	†250Ω	NC	†680Ω
V8	6BQ5	100K	100K	150Ω	250Ω	250Ω	NC	†250Ω	NC	†680Ω
V9	5U4GB	NC	¶	NC	2Ω	2Ω	NC	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V9.
▶ MEASURED FROM PIN 8 OF V3.
▲ MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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RCA VICTOR MODEL PM14
(Ch. 2P24, 6P23)

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE		
V1	Left Channel Preamplifier	12AU7A	V6	Right Channel AF Amp. - Phase Inverter	7025		
V2	Right Channel Preamplifier	12AU7A	V7	Right Channel Output	6BQ5 (EL84) *		
V3	Left Channel AF Amp. - Phase Inverter	7025	V8	Right Channel Output	6BQ5 (EL84) *		
V4	Left Channel Output	6BQ5 (EL84) *	V9	Rectifier	5U4GB		
V5	Left Channel Output	6BQ5 (EL84) *					

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	108181	AFH4-79-20	B0462	FP377	TMD-56	TVLS-3695 *	
B	■40	400			BR4045	TC75	TD-40-450		
C	▲40	400							
C2A	▲100	25	102914	AFH2-06-20	B0085	WP202.5	TMD-107	TVL-2326	
B	■100	25							
C3	20	350	99149	PRSI735	BR2035	TC65	TD-20-350	TVA-1608	
C4	100	10	108019	SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1162	
C5	100	10	108019	SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1162	
C6	5	10NP	108182	NP-PRS7550	BBR10-25 †	TCN105		TVAS-1110 *	
C7	5	10NP	108182	NP-PRS7550	BBR10-25 †	TCN105		TVAS-1110 *	

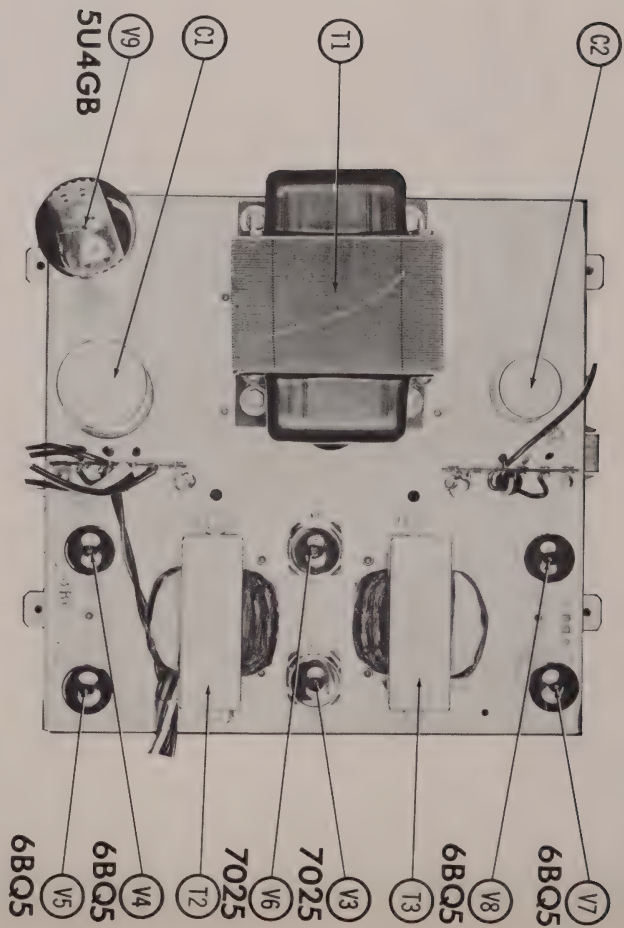
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	62 NPO 10%	#108191		TCZ-62	C10Q62C			
C9	22 N75 10%	#108192				*		
C10	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C11	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C12	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C13	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C14	1500 10%		DI-1500	DD-152	PM6DI5	CCD-152	GP215	10TS-DI5
C15	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C16	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C17	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C18A	1500		BPD-2X0015	DD2-152	BYC6DDI5	CCD-152 CCD-152	B2X215	5HK-2DI5
B	1500							
C19	.0047 400V		P488N-0047	D6-472	CUB6Q47	6DP-1-472	GEM-6247	6TM-D47
C20	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C21	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C22	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C23	75 N220 5%	#108193				*		
C24	62 NPO 5%	#108191		TCZ-62	C10Q62C			
C25	22 N75 10%	#108192				*		
C26	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C27	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C28	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C29	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C30	1500 10%		DI-1500	DD-152	PM6DI5	CCD-152	GP215	10TS-DI5
C31	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C32	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C33	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C34A	1500		BPD-2X0015	DD2-152	BYC6DDI5	CCD-152 CCD-152	B2X215	5HK-2DI5
B	1500							
C35	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C36	.022 400V		P488N-022	DD-203	CUB4S47	4DP-2-223	GEM-4122	4TM-S22
C37	82 10%		1469-000082	TCZ-82	22R5Q82	CM-20B-820K	CNO-482	MS-482
C38	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C39	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C40	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C41	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C42	82 10%		1469-000082	TCZ-82	22R5Q82	CM-20B-820K	CNO-482	MS-482
C43	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C44	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C45	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C46	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C47	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

RCA Victor Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *		108198				■ UE4035	Loudness, Left Channel
B	2meg *							Loudness, Right Channel
R2A	100K		108199	B-40	A47-100K-S	Q11-128	U41	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg 700K tap		108195				▲ UE4042	Level, Left Channel
B	2meg 700K tap							Level, Right Channel
R4A	500K		108196	B-60	AD47-500K-Z			Treble, Left Channel
B	500K			SR-60	Not Req.		▲ UE1398	Treble, Right Channel
C	Shaft			Not Req.	KS-3			
R5A	1meg		108197	B-70	AD47-1meg-Z			Bass, Left Channel
B	1meg			SR-70	Not Req.		♦ UE3913	Bass, Right Channel
C	Shaft			Not Req.	FS-3			
R6A	400Ω	2(WW)	108187	WN-401	A43-400	W11-202	R500L	Hum Bal., Left Channel
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	
R7A	400Ω	2(WW)	108187	WN-401	A43-400	WN-202	R500L	Hum Bal., Right Channel
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

* Taps @ 750K and 1.5meg.
▪ "STA-LOC" Equivalent: FA26DT155, RU26DT155, CS3500.
▲ "STA-LOC" Equivalent: FB26T75, RU26T75, CS3500.
▪ "STA-LOC" Equivalent: FA55A, RU55A, CS3500.
♦ "STA-LOC" Equivalent: FA16A, RU16A, CS3500.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	1.2meg	
R9	1meg	
R10	1meg	
R11	47K	
R12	470K	
R13	33K	
R14	180K	
R15	390K	
R16	180K	
R17	2.2meg	
R18	47K	
R19	3300Ω	
R20	1.2meg	
R21	1meg	
R22	1meg	
R23	47K	
R24	1000Ω	
R25	470K	
R26	33K	
R27	180K	

ITEM No.	RATING	REMARKS
R28	390K	
R29	180K	
R30	2.2meg	
R31	47K	
R32	1000Ω	
R33	3300Ω	
R34	2700Ω	
R35	470K	
R36	330K	
R37	560Ω	
R38	180K	
R39	470K	
R40	82K	
R41	2200Ω	
R42	82K	
R43	100Ω	
R44	100K	
R45	100Ω	
R46	100K	
R47	130Ω 5W	

ITEM No.	RATING	REMARKS
R48	5100Ω	
R49	470K	
R50	330K	
R51	560Ω	
R52	180K	
R53	470K	
R54	82K	
R55	2200Ω	
R56	82K	
R57	100Ω	
R58	100K	
R59	100Ω	
R60	100K	
R61	130Ω 5W	
R62	5100Ω	
R63	8200Ω 2W	
R64	680Ω 5W	
R65	68Ω	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.3A	620VCT @ .180A	5V @ 3A	108178						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.1A	6.3V @ 2.25A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9500Ω CT	6-8Ω	108188							
T3	9500Ω CT	6-8Ω	108188							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	108180	12A1Z7.2	
SP2	5"	PM	6-8Ω	108179	5A1Z5.7	
SP3	12"	PM	6-8Ω	108180	12A1Z7.2	
SP4	5"	PM	6-8Ω	108179	5A1Z5.7	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	106960	13TB	Not Req.	26V				8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	106788 (78RPM)	W-105STS † or W-105ST ♦	M76 † or M76D ♦	† Jewel ♦ Diamond
	106786 (LP)	W-105MGS † or W-105MGD ♦	M-76XD † or M-77XD ♦	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Switch	108200	Function, Off-On

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

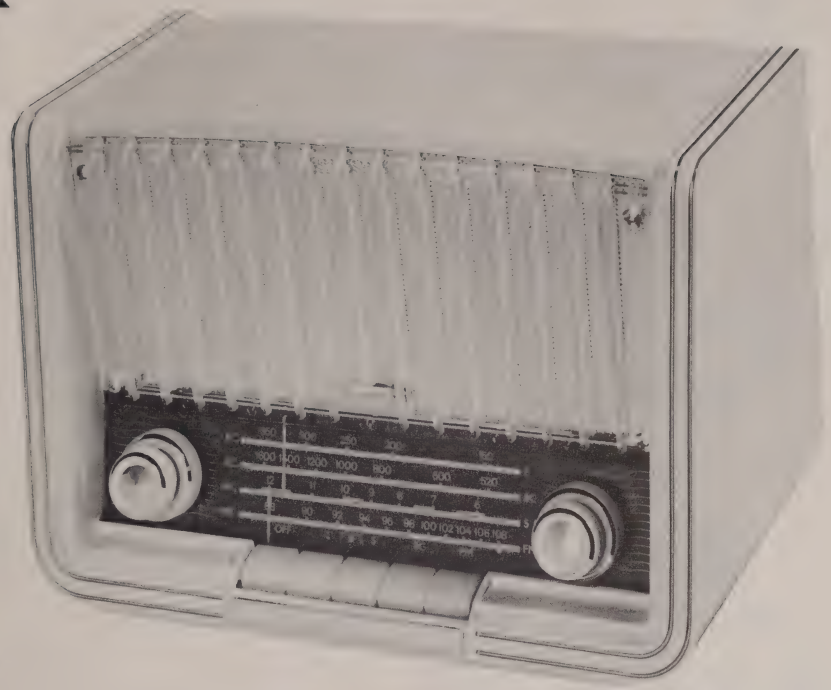
NAME	PART NO.	DESCRIPTION
Knob	108212	Controls
Cabinet Leg	Y7052	Mahogany
Cabinet Leg	Y7053	Oak
Cabinet Leg	Y7054	Walnut

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

SABA MODEL
Sabine-M



SABA MODEL
Sabine-M

SABA MODEL
Sabine-M

TRADE NAME	Saba Model Sabine-M		
IMPORTER	A. E. Dufenhorst Co., 121 N. Third Street, Rockford, Illinois		
TYPE SET	AC Operated 6 Tube FM-BC-SW-LW Receiver		
POWER SUPPLY	110-120 (or) 220 Volts AC-DC	RATING	32 Watts, .32 Watts, .32 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 510-1630KC FREQ. MOD. 88-108MC	LONG WAVE SHORT WAVE	145-350KC 5.8-12.3MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JK600

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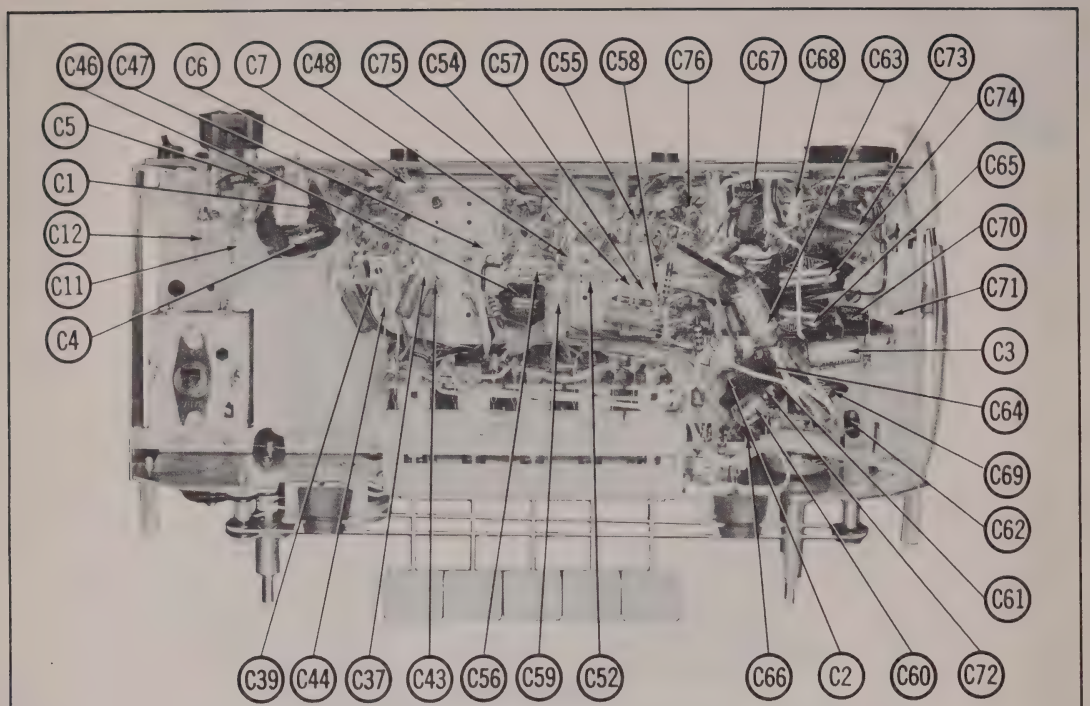
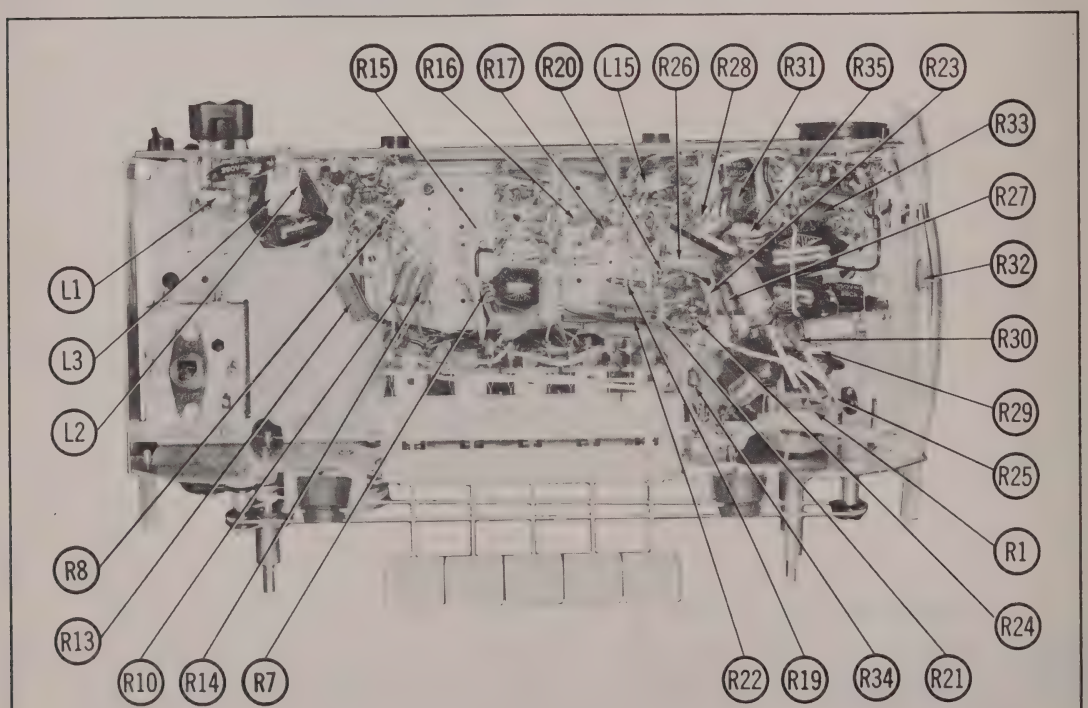
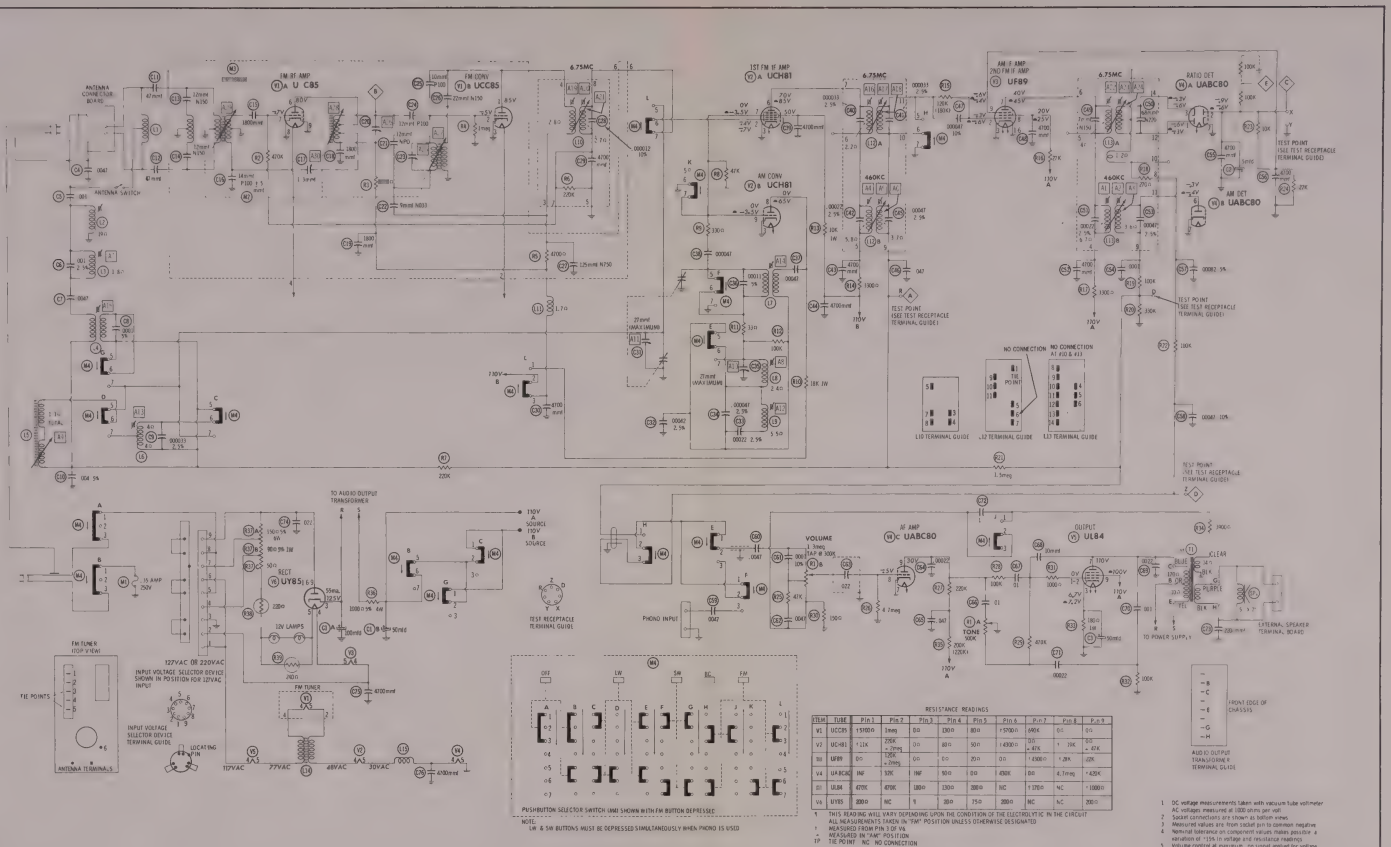
SET 482 FOLDER 14



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	UCC85	1500Ω	1meg	0Ω	130Ω	80Ω	5700Ω	690K	0Ω	0Ω
V2	UCH81	11K	250K	0Ω	80Ω	50Ω	1430Ω	0Ω	1 10K	0Ω
			2.2meg					420K		420K
V3	UF89	0Ω	1.2MΩ	0Ω	0Ω	20Ω	0Ω	4300Ω	1.2M	22K
V4	UABC80	1MΩ	10K	1MΩ	10Ω	0Ω	450K	0Ω	4.1meg	420K
V5	UY85	470K	470K	1800Ω	130Ω	300Ω	NC	1270Ω	NC	1000Ω
V6	UL84	200Ω	NC	1Ω	20Ω	75Ω	200Ω	NC	NC	200Ω

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 3 OF V6
TP THE POINT NC NO CONNECTION

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1 DC voltage measurements taken with vacuum tube voltmeter
AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom view
3 Measured values are from socket pin to common negative
4 Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
5 Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SABA MODEL
Sabine-M

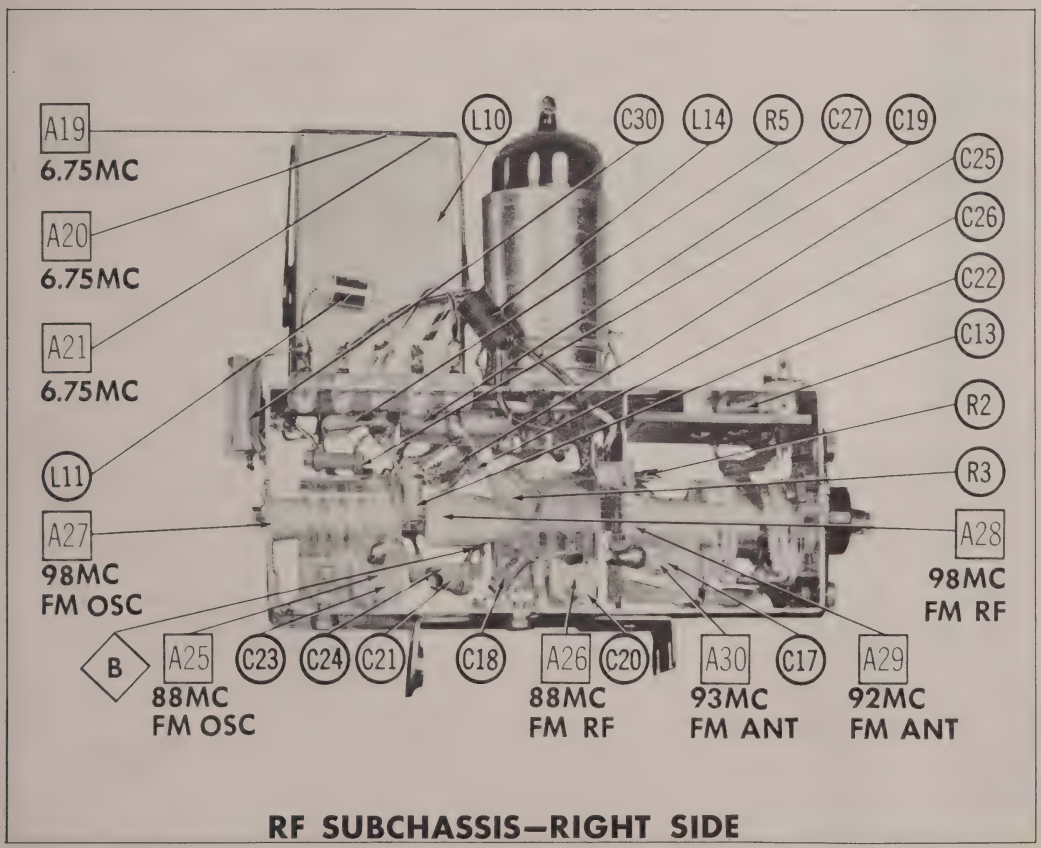
AM ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Suggested Alignment Tools: A1 thru A8, A12, A14 thru A24 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531 A25, A26 ..... GENERAL CEMENT #5097, 8727 WALSCO #2515 A30 ..... GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722. 9150, 9298, 5003 WALSCO #2516, 2519

AM ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 2 (grid) of AM Converter. Low side to chassis.	460KC (400~ 30% AM)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3	Detune A3 by turning counterclockwise. Adjust A1 and A2 for maximum output. Adjust A3 for maximum output.
2.	"	"	"	"	"	A4, A5, A6	Detune A6 by turning counterclockwise. Adjust A4 and A5 for maximum output. Adjust A6 for maximum output.
3.	High side thru 200mmf and 400Ω in series to AM Ant. Term. Low side to chassis.	"	LW	"	"	A7	Adjust for MINIMUM output.
4.	"	570KC	BC	570KC	"	A8, A9	Adjust for maximum output.
5.	"	1520KC	"	1520KC	"	A10, A11	Adjust for maximum output. Repeat steps 4 and 5.
6.	"	190KC	LW	190KC	"	A12, A13	Adjust for maximum output.
7.	"	7.2MC	SW	7.2MC	"	A14, A15	"



RF SUBCHASSIS—RIGHT SIDE

FM ALIGNMENT INSTRUCTIONS

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓒ to chassis. The junction of these two resistors is alignment point Ⓔ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side thru 1000mmf to point Ⓑ. Low side side to chassis.	6.75MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓒ. Common to chassis.	A16, A17, A18	Detune A18 by turning counterclockwise. Adjust A16 and A17 for maximum deflection. Adjust A18 for maximum deflection.
9.	"	"	"	"	"	A19, A20, A21	Detune A21 and adjust A19 and A20 for maximum deflection. Adjust A21 for maximum deflection.
10.	"	"	"	"	"	A22	Detune A24 and adjust A22 for maximum deflection.
11.	"	"	"	"	DC probe to point Ⓓ. Common to point Ⓔ.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A24	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	High side thru 1000mmf to point Ⓑ. Low side to chassis.	6.75MC (450KC swp.)	FM	Point of non-interference	Vert. Amp. to point Ⓒ. Low side to chassis.	A16, A17, A18	Disconnect stabilizing capacitor C2. Detune A18 by turning counterclockwise. Adjust A16 and A17 for maximum gain and symmetry of response similar to Fig. 1. Adjust A18 for maximum gain.
9.	"	"	"	"	"	A19, A20, A21	Detune A21 and adjust A19 and A20 for maximum gain and symmetry of response similar to Fig. 1. Adjust A21 for maximum gain.
10.	"	"	"	"	"	A22	Detune A24 and adjust A22 for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
11.	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A23	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A22 for maximum amplitude and straightness of crossover lines.
12.	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A24	Disconnect C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.

FM RF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
13.	Across FM antenna terminals.	88MC (Unmod.)	FM	88MC	DC probe to point Ⓒ. Common to chassis.	A25, A26	Adjust for maximum deflection.
14.	"	98MC	"	98MC	"	A27, A28	"
15.	"	92MC	"	92MC	"	A29	"
16.	"	93MC	"	93MC	"	A30	Disconnect plate voltage from FM RF Amp. Set generator output to .5MV. Adjust A30 for MINIMUM deflection. Reconnect plate voltage. Repeat steps 13 and 15.

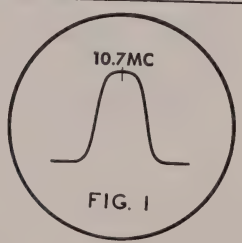


FIG. 1

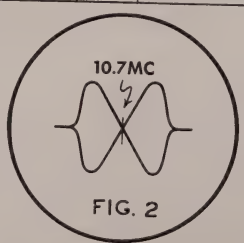
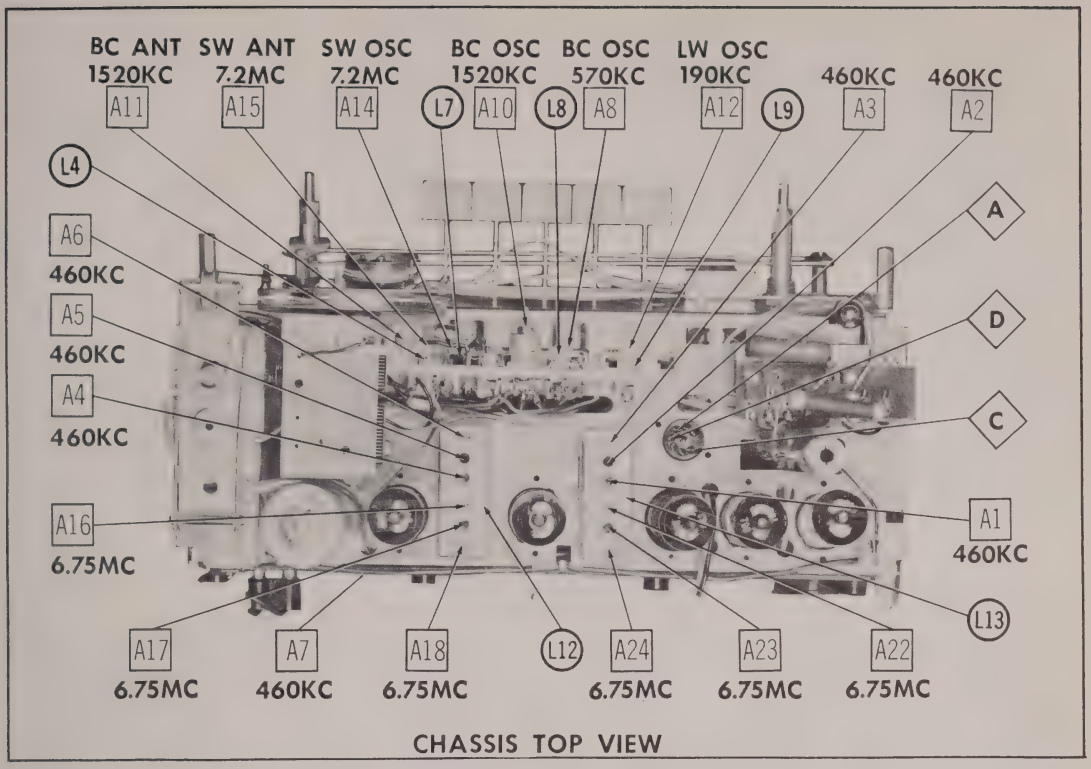
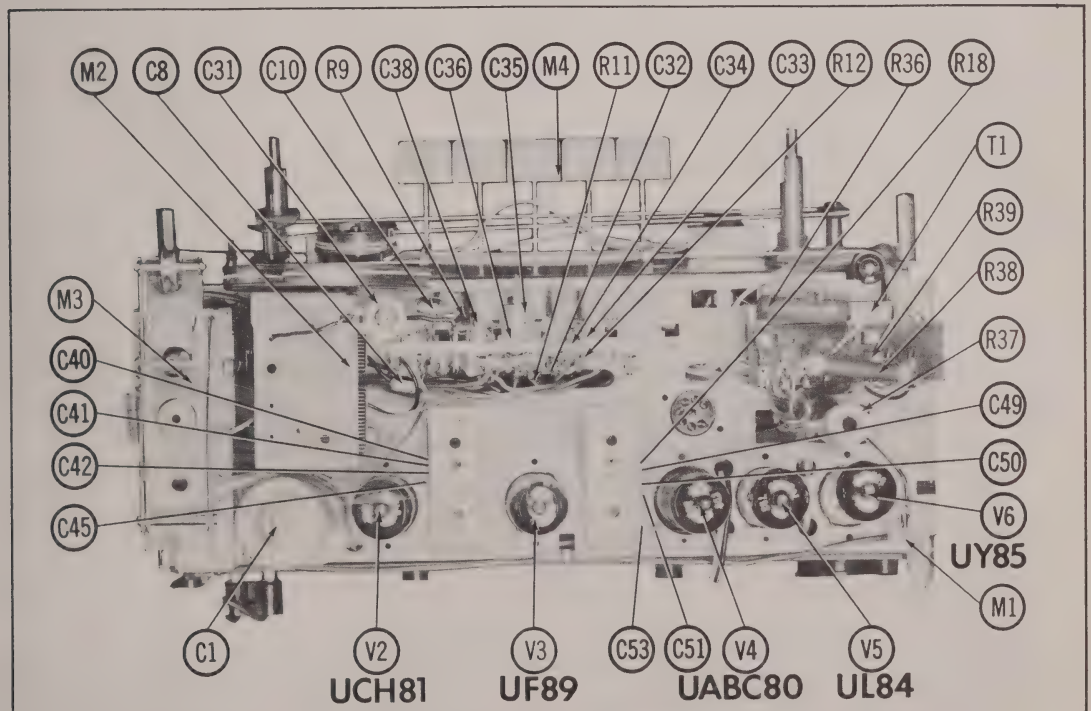


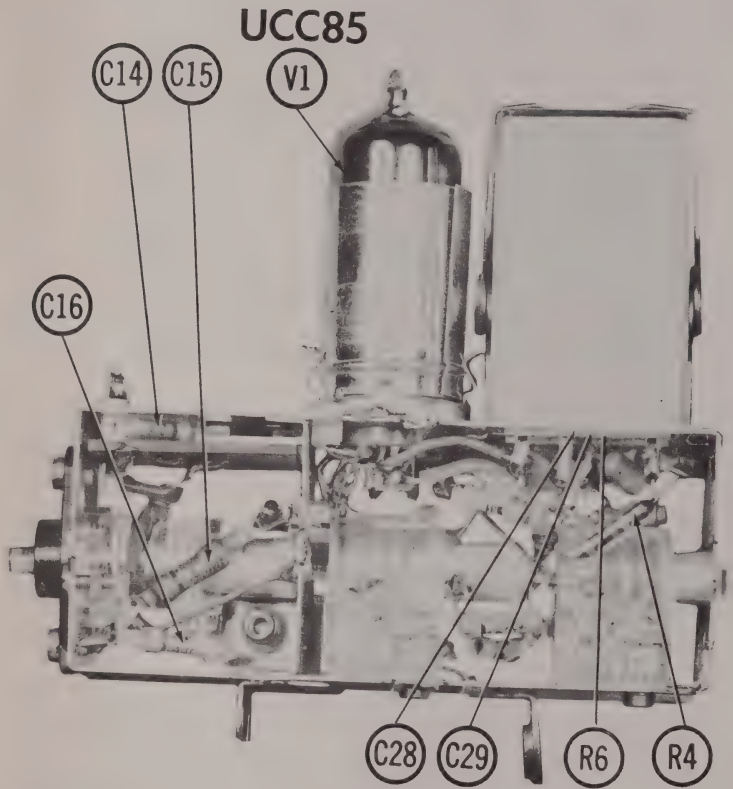
FIG. 2



CHASSIS TOP VIEW



CHASSIS TOP VIEW



RF SUB CHASSIS - LEFT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	UCC85	V4	Ratio Det. - AM Det. - AF Amplifier	UABC80
V2	1st FM IF Amp. - AM Conv.	UCH81	V5	Output	UL84
V3	2nd FM IF Amp. - AM IF Amplifier	UF89	V6	Rectifier	UY85

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SABA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	100	250	3257015000						
B	50	250							
C2	5	70	3251193000	SRE150V5	NLW5-100	TT150X5	TD-4-150	TE-1404	
C3	50	12.5	3251179000	SRE25V50	BBR50-25	TT15X50	ML50-15	TE-1160	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.0047 250V		P488N-0047	DD-472	CUB6D47	4DP-3-472	GEM-6247	6TM-D47
C5	.001 250V		P288N-001	DD-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C6	.001 125V 2.5%	#3151146000				CM-20E-102G	MCE255	
C7	.0047 125V		P288N-0047	DD-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C8	.0001 125V 5%				22R5T1	CM-193-101J	MCE235	MS-310
C9	.000033 125V 2.5%	#3151128000		TCZ-33		CM-15-E-330G		
C10	.004 125V 5%		V84C6D4-5%		1R5D4	CM-19B-392J	MCJ462.5	5BF-D39
C11	47		SI 47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C12	47		SI 47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C13	12 N150	#3971001111				*		10TCP-Q12
C14	12 N150	#3971001111				*		10TCP-Q12
C15	1800		SI 1800	DD-182	L10D18	CCS-182	GP218	10TS-D18
C16	14 P100 .5mmf	#3201201000						
C17	1-3	#3201001000						
C18	1800		SI 1800	DD-182	L10D18	CCS-182	GP218	10TS-D18
C19	1800		SI 1800	DD-182	L10D18	CCS-182	GP218	10TS-D18
C20								
C21	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C22	9 N033	#3204043000						
C23								
C24	12 P100	#3201050000						
C25	10 P100	#3201049000						
C26	22 N150	#3206048000				*		10TCP-Q22
C27	125 N750		N750-SI 130	TCN-130	C10T13U	CCTN-121	CN7-312	10TCU-T12
C28	.000012 125V 10%			DD-120	L10Q12	CCD-120	GP412	10TS-Q12

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C29	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C30	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C31	27 Max.	#3238001000						
C32	.00042 125V 2.5%	#3151232000				CM-15-E-431G		
C33	.00022 125V 2.5%	#3151138000		TCZ-220		CM-15-E-221G		
C34	.000047 125V 2.5%			TCZ-47		CM-15-E-470G	MCE244	
C35	27 Max.	#3238001000						
C36	.00011 125V 5%			TCZ-110	22R5T11	CM-20B-111J		MS-311
C37	.00047 500V			DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C38	.000047 125V			DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C39	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C40	.000033 125V 2.5%	#3151128000		TCZ-33		CM-15-E-330G		
C41	.000033 125V 2.5%	#3151128000		TCZ-33		CM-15-E-330G		
C42	.00022 125V 2.5%	#3151138000		TCZ-220		CM-15-E-221G		
C43	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C44	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C45	.00047 125V 2.5%	#3151142000				CM-15-E-471G	MCE244	
C46	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C47	.000047 125V 10%			TCZ-47	L10Q47	CM-19B-470K	GP447	10TS-Q47
C48	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C49	7 N150	#3206203000				*		10TCP-V68
C50	68 N220	#3207073000				*		10TCR-Q68
C51	.00022 125V 2.5%	#3151138000		TCZ-220		CM-15-E-221G		
C52	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C53	.00047 125V 2.5%	#3151142000				CM-15E-471G	MCE244	
C54	.0001 125V		P688N-0001	DD-101	CUB6T1	CCD-101	GP310	10TS-T10
C55	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C56	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C57	.00082 125V 5%				1R5T82	CM-19B-821J	MCE251	MS-382
C58	.00047 125V 10%			DD-471	5R5T47	CM-19B-471K	GP347	10TS-T47
C59	.0047 250V		P488N-0047	DD-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C60	.0047 125V		P288N-0047	DD-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C61	.0001 125V 10%			DD-101	PM6T1	CCD-101	GP310	10TS-T10
C62	.0047 250V		P488N-0047	DD-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C63	.022 125V	#3113001000						
C64	.00022 500V		P688N-00025	DD-221	L10T22	CCD-221	GP322	10TS-T22
C65	.047 500V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C66	.01 500V		P688N-01	DD-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C67	.01 500V		P688N-01	DD-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C68	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C69	.0022 500V		P688N-0022	DD-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C70	.001 500V		P688N-001	DD-102	CUB6D1	6DP-1-102	6TM-621	6TM-D1
C71	.00022 500V		P688N-00025	DD-221	L10T22	CCD-221	GP322	10TS-D22
C72	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C73	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C74	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C75	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C76	4700		SI 4700	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47

Saba Part Number. * Not normally in distributor's stock. Available thru distributor on order to manufacturer.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SABA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B	500K L. 3meg 300K Tap		5800-000-604					Tone Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	470K	
R3	4700Ω	
R4	1meg	
R5	4700Ω	
R6	220K	
R7	220K	
R8	47K	
R9	330Ω	
R10	18K 1W	
R11	33Ω	
R12	100K	
R13	10K 1W	
R14	3300Ω	
R15	120K	(180K) *

ITEM No.	RATING	REMARKS
R16	27K	
R17	3300Ω	
R18	270Ω	
R19	100K	
R20	330K	
R21	1.5meg	
R22	100K	
R23	10K	
R24	22K	
R25	47K	
R26	4.7meg	
R27	220K	
R28	100K	
R29	470K	

ITEM No.	RATING	REMARKS
R30	150Ω	
R31	1000Ω	
R32	100K	
R33	180Ω 1W	
R34	3900Ω	
R35	200K	(220K) *
R36	1000Ω 5% 4W	
R37A	150Ω 5% 6W	
B	90Ω 5% 1W	#391620311
C	50Ω 1/2W	
R38	220Ω	#3921005111
R39	240Ω	#3921006111

Saba Part Number.

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SABA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Antenna Coil							
L2	Trap Coil							
L3	IF Trap Coil							
L4	SW Antenna Coil							
L5	BC Loopstick	3882003111			BC-419			
L6	LW Antenna Coil							
L7	SW Osc. Coil							
L8	BC Osc. Coil							
L9	LW Osc. Coil							
L10	1st FM IF Trans.	5800920003						
L11	RF Choke		19-1004	19-1004	BC-565	4610		7uh
L12A	2nd FM IF Trans.	5800400002						
B	1st AM IF Trans.							
L13A	Ratio Det.	5800410002						
B	2nd AM IF Trans.							
L14	Fil. Choke							
L15	Fil. Choke		19-1002	19-1002	BC-563	4606		2.4uh

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3300Ω	3-4Ω SEC. 2 85Ω	5890215004 ①							① Alternate Part #5800025004

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SABA PART No.	QUAM PART No.	
SP1	5" x 7"	PM	3-4Ω	5898220002		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SABA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
MI		.35A 250V S/B	3505-070-000	5800-047-004				

MISCELLANEOUS

ITEM No.	PART NAME	SABA PART No.	NOTES
M2	Tuning Cap.	5800000053	2 Gang
M3	FM Tuner	5800900002	Complete (Less Tubes)
M4	Switch	5800060003	Pushbutton Type Complete, Includes Off-LW-SW-BC-FM
	Tuning Shaft	5800048004	AM
	Tuning Shaft	5800000265	FM
	Dial Lamp	3501211000	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

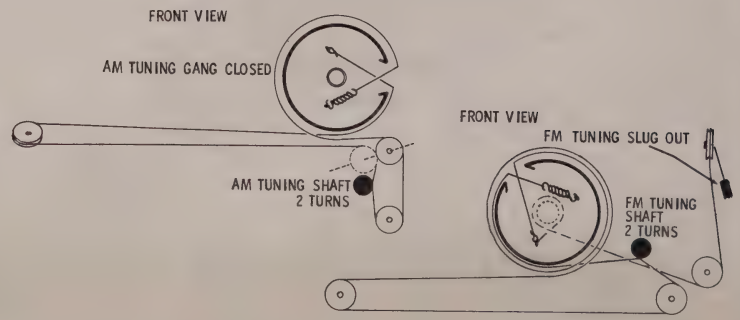
NAME	PART NO.	DESCRIPTION
AM Dial Pointer	5800058004	
FM Dial Pointer	5800059004	
Cabinet	5800053002	Brown
Cabinet	5800052002	Ivory
Knob	2872017000	Large, Brown
Knob	2872018000	Large, Ivory
Knob	2871011000	Small, Brown
Knob	2871012000	Small, Ivory

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING



PHOTOFACT® Folder

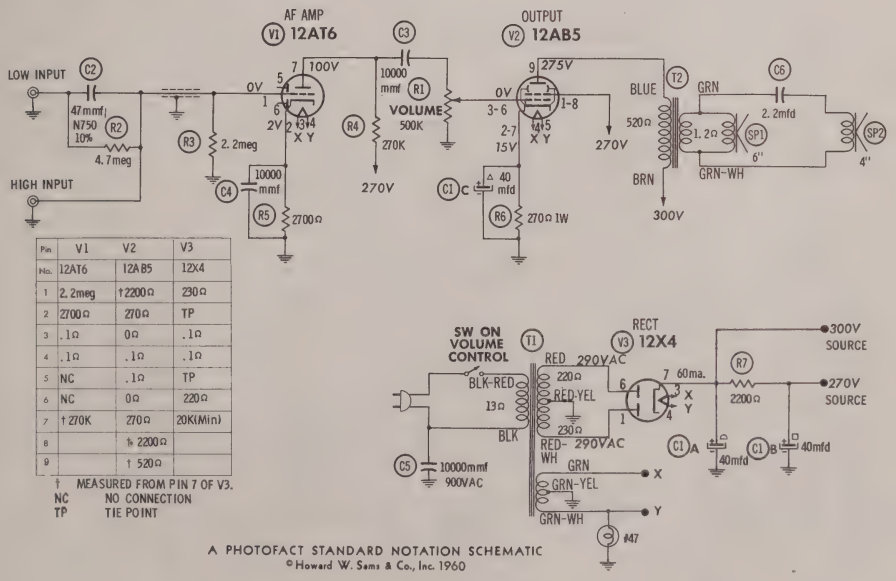
WEBCOR MODELS 4905-1A, 4954-1, (Ch. 14X306-1)

WEBCOR MODELS 4905-1A, 4954-1, (Ch. 14X306-1)

MODEL EP4905-1A

WEBCOR MODELS 4905-1A, 4954-1, (Ch. 14X306-1)

TRADE NAME	Webcor Models EP4905-1A, TP4905-1A, EP4954-1, TP4954-1A (Ch. 14X306-1)		
MANUFACTURER	Webcor, Inc., 5610 W. Bloomingdale Ave., Chicago 39, Illinois		
TYPE SET	AC Operated 3 Tube Audio Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	37 Watts, .39 Amp. @ 117 Volts AC



Pin No.	V1 12AT6	V2 12AB5	V3 12X4
1	2.2meg	†2200Ω	230Ω
2	2700Ω	270Ω	TP
3	.1Ω	0Ω	.1Ω
4	.1Ω	.1Ω	.1Ω
5	NC	.1Ω	TP
6	NC	0Ω	220Ω
7	†270K	270Ω	20K(Min)
8		½ 2200Ω	
9		† 520Ω	

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 482 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	12AT6	V3	Output	12X4
V2	Output	12AB5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WEBCOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▰40	400	30P292	AFH3-134	C1080	FP369.1	TMT-134	TVL-3744	
B	■40	350							
C	▲40	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP-110	5HK-S10
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP-110	5HK-S10
C5	10000 900 VAC			UK-225				HY150
C6	2.2mfd 3V							

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WEBCOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	31P144	B-60-S	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4.7meg	
R3	2.2meg	

ITEM No.	RATING	REMARKS
R4	270K	
R5	2700Ω	

ITEM No.	RATING	REMARKS
R6	270Ω 1W	
R7	2200Ω	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA WEBCOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .39A	580VCT @ .060A	12.6VCT @ 1.1A	68P074						

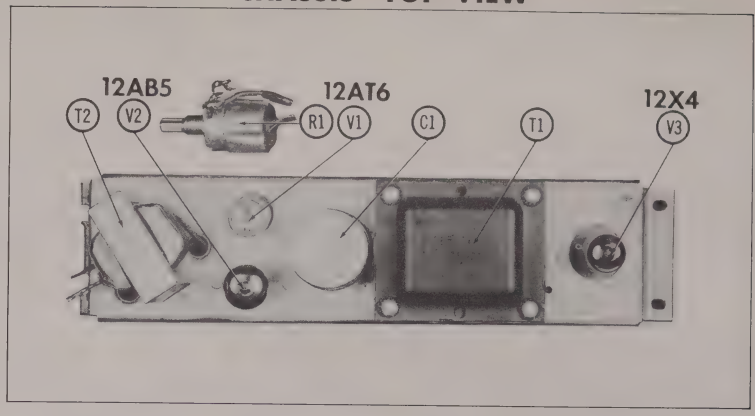
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA WEBCOR PART No.	Halldorson PART No.	Merit* PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5000Ω	6-8Ω	67P073	24S17	A-2904	AU-600	A-3823	24S17	S-55Z	

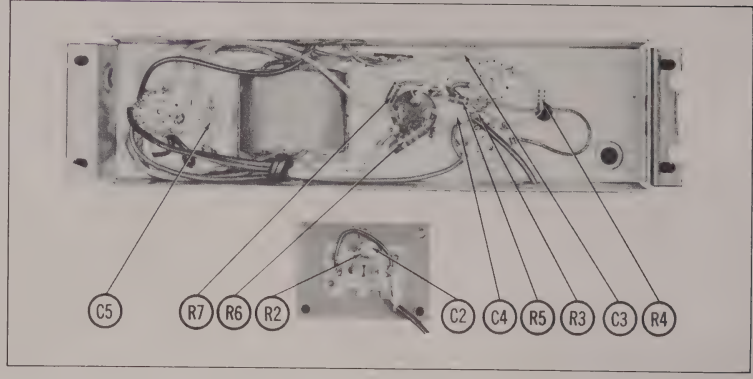
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA WEBCOR PART No.	QUAM PART No.	NOTES
SP1	6"	PM	6-8Ω	76P061	6A3IZ8.5	
SP2	4"	PM	21-24Ω	76P050	4A1Z22	

CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



WIRING DATA

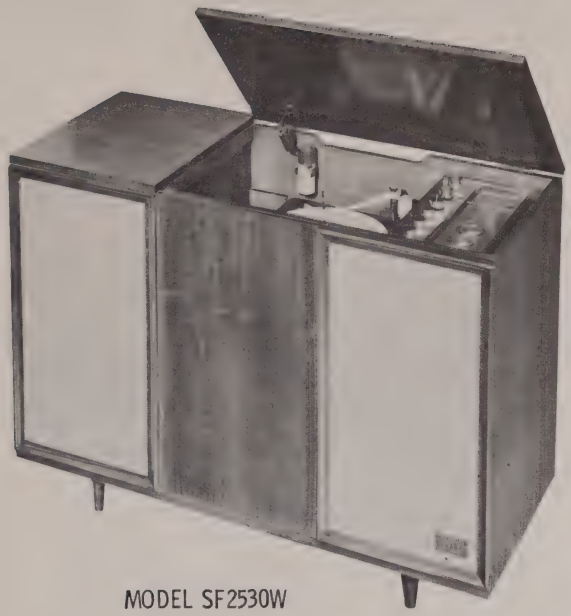
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder

ZENITH MODELS SF2530E, R, W, (Ch. 3B32, 9B26)

ZENITH MODELS SF2530E, R, W, (Ch. 3B32, 9B26)



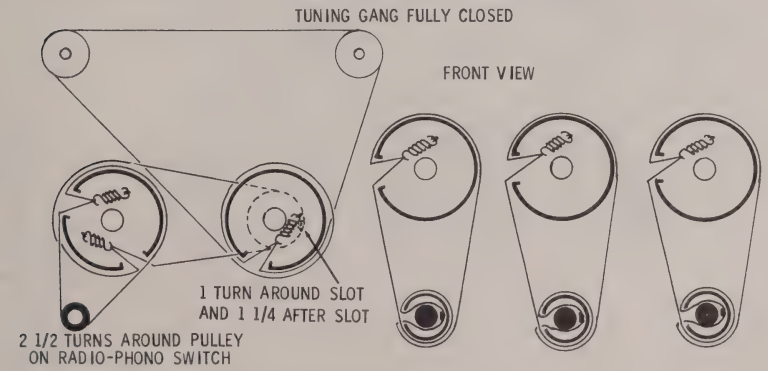
MODEL SF2530W

ZENITH MODELS SF2530E, R, W, (Ch. 3B32, 9B26)

TRADE NAME	Zenith Models SF2530E, SF2530R, SF2530W, (Tuner Ch. 9B26, Amp. Ch. 3B32)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	AC Operated 9 Tube FM-AM Tuner, 3 Tube Stereo Amplifier And 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	100 Watts, 1 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 - 1620KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #169-106 — SEE ZENITH S-14084 — PHOTOFACT SET 392 FOLDER 14.

DIAL CORD STRINGING



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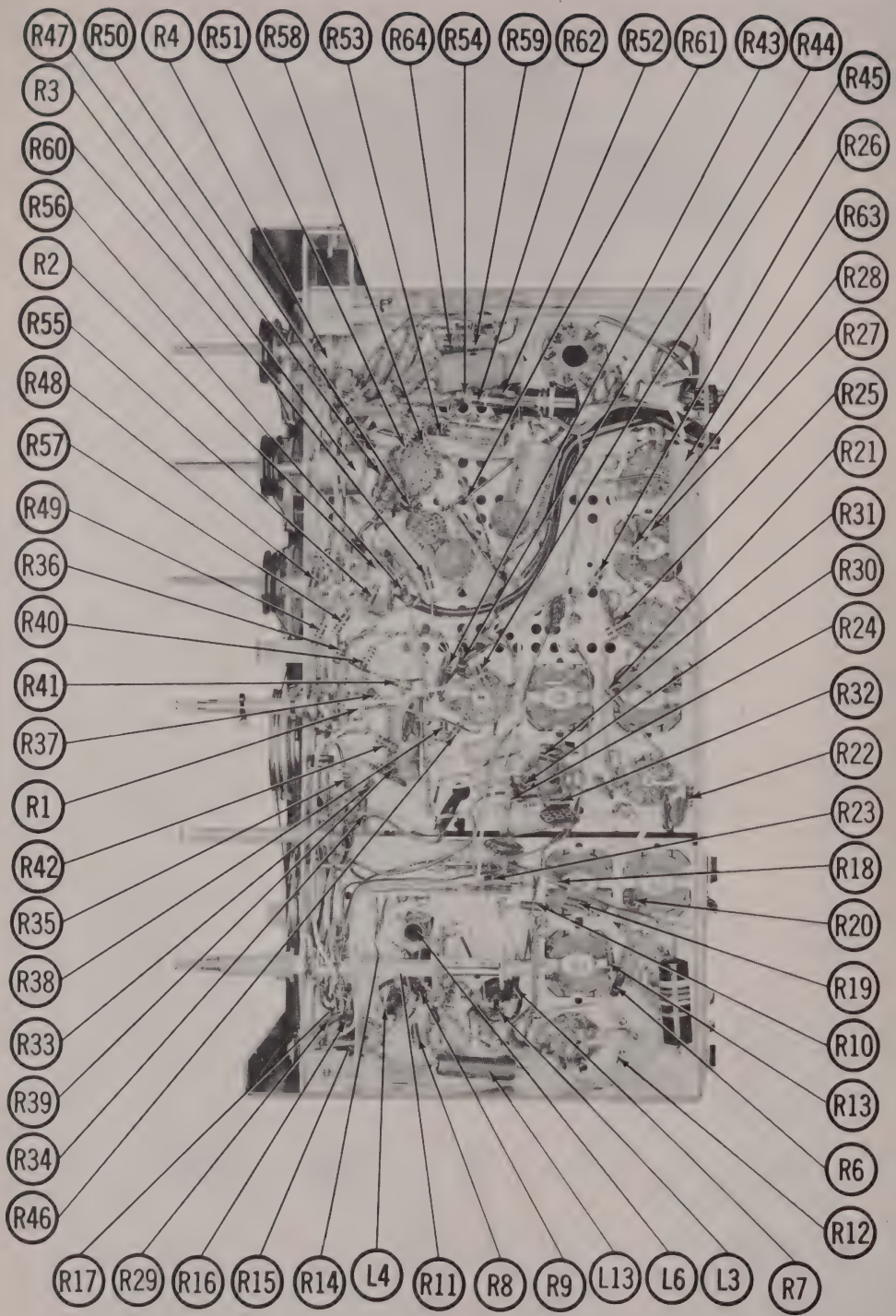
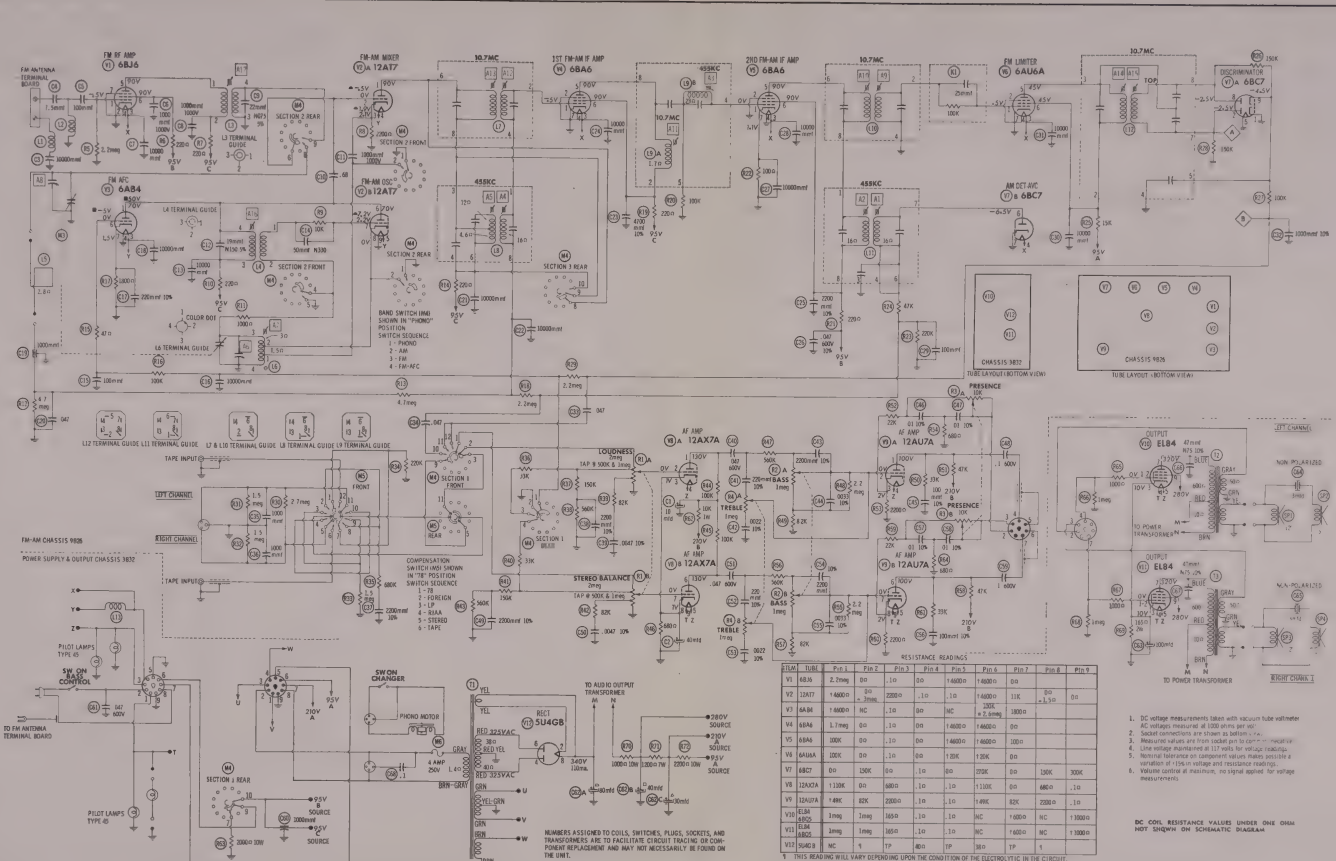
JN525

SET 482 FOLDER 16



TUNER CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	2.7meg	0Ω	.1Ω	0Ω	↑400Ω	↑400Ω	0Ω		
V2	12AT7	↑400Ω	0Ω 3meg	220Ω	.1Ω	.1Ω	↑400Ω	11K	0Ω ±1.5Ω	0Ω
V3	6BA6	↑ 600Ω	NC	.1Ω	0Ω	NC	130K ± 2.5meg	1800Ω		
V4	6BA6	1.7meg	0Ω	.1Ω	0Ω	↑ 600Ω	↑ 600Ω	0Ω		
V5	6BA6	100K	0Ω	.1Ω	0Ω	↑ 600Ω	↑ 600Ω	100Ω		
V6	6AU6A	100K	0Ω	.1Ω	0Ω	120K	120K	0Ω		
V7	6BC7	0Ω	150K	0Ω	.1Ω	0Ω	270K	0Ω	150K	300K
V8	12AX7A	1130K	0Ω	680Ω	.1Ω	.1Ω	1130K	0Ω	680Ω	.1Ω
V9	12AU7A	1.49K	82K	2200Ω	.1Ω	.1Ω	1.49K	82K	2200Ω	.1Ω
V10	EL84 6BQ5	1meg	1meg	165Ω	.1Ω	.1Ω	NC	↑ 600Ω	NC	↑ 1000Ω
V11	EL84 6BQ5	1meg	1meg	165Ω	.1Ω	.1Ω	NC	↑ 600Ω	NC	↑ 1000Ω
V12	5U4GB	NC	↑	TP	400	TP	310	TP	↑	

↑ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
= MEASURED IN "AM" POSITION.
! MEASURED FROM PIN 8 OF V12.
= MEASURED IN "FM-AFC" POSITION.
NC NO CONNECTION TP TIE POINT

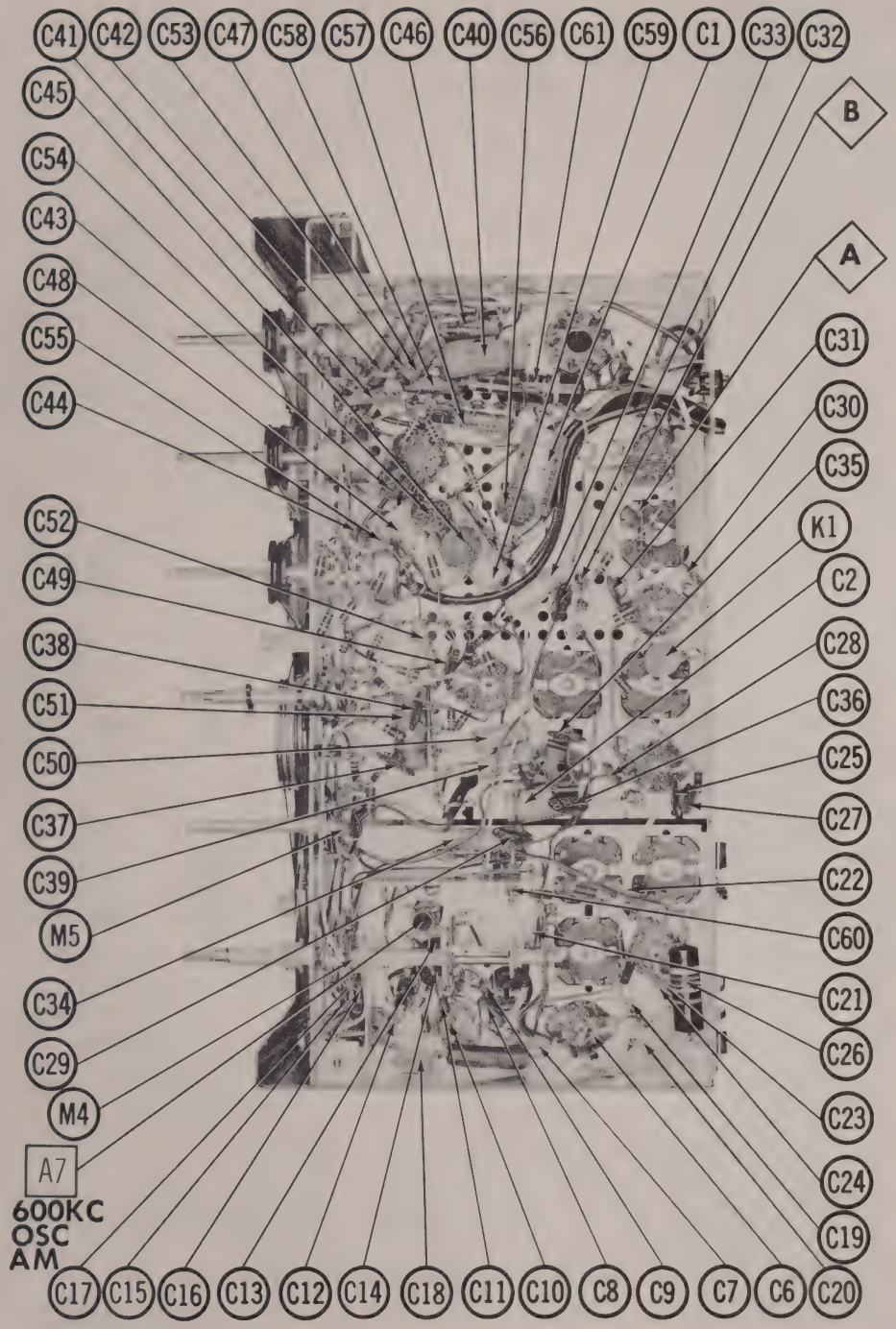
RESISTANCE READINGS

1. DC voltage measurements taken with vacuum tube voltmeter
2. AC voltages measured at 1000 ohms per volt
3. Socket connections are shown as bottom view
4. Measured values are from socket pin to chassis ground
5. Line voltage maintained at 117 volts for voltage readings
6. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

ZENITH MODELS 5F2530E, R, W, (Ch. 3832, 9826)



TUNER CHASSIS BOTTOM VIEW
ALIGNMENT, CAPACITOR & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A5, A7, A9 thru A15..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

A6, A8..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT—BANDSWITCH IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side to pin 2 (grid) of AM Mixer. Low side to chassis.	455KC (400∿ Mod.)	(AM) 600KC	Across voice coil.	A1, A2, A3, A4, A5	Adjust for maximum output.
2.	Loop	1600KC	1600KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	600KC	"	A7	"
4.	"	1400KC	Tune to 1400KC signal	"	A8	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—BANDSWITCH IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .05 to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to pin 1 (grid) of FM Limiter. Common to chassis.	A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A14	"
7.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .05mfd to pin 2(grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp	(FM) Point of non-interference.	Vert. amp. to pin 1(grid) of FM Limiter. Low side to chassis.	A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. thru 27K to point Ⓐ. Low side to chassis.	A14	"
7.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT — BANDSWITCH IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 270Ω in high side.	98MC (Unmod.)	(FM) 98MC	DC probe to pin 1 (grid) of FM Limiter.	A16, A17	Adjust for maximum deflection.

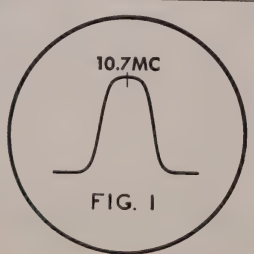


FIG. 1

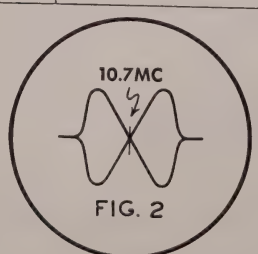


FIG. 2

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6BJ6
V2	FM AM Mixer-FM AM Osc.	12AT7
V3	FM AFC	6AB4
V4	1st FM-AM IF Amp.	6BA6
V5	2nd FM-AM IF Amp.	6BA6
V6	FM Limiter	6AU6A

ITEM No.	USE	TYPE
V7	Discriminator-AM Det. -AVC	6BC7
V8	Left Channel AF Amp. - Right Channel AF Amp.	12AX7A
V9	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A

ELECTROLYTIC CAPACITORS

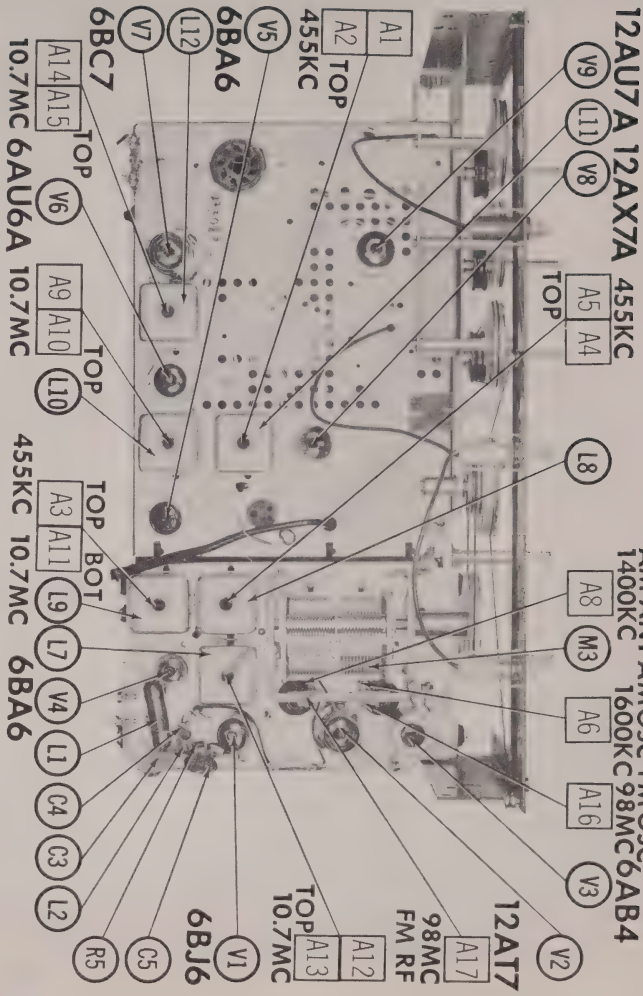
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	10	350	22-2943	PRS1620	BR1045	TC62	TD-10-450	TVA-1604	
C2	40	25	22-1156	PRS1470	BR4015	TC48	TD-40-150	TVA-1413	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	7.5			DD-7R5	L10V8			10TS-V75
C5	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C6	1000 1000V			DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	1000 1000V			DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C9	22 N075 5%	#22-1506						
C10	.68	#22-1766	NPO-SI .68	TCZ-R68				
C11	1000 1000V			DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C12	19 N150 5%	#22-2630						10TCP-Q18
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14	50 N330	#22-1367		TCA-47				10TCS-Q47
C15	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S1
C17	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C19	1000		EF-001	MFT-1000		CCF-102	CT280A	5HK-D10
C20	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	4700 10%		DI-4700		PM6D47	CCD-472	JL-247	10TS-D47
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C25	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C26	.047 600V 10%		V84C6S47-10%		PM6S47	6DP-3-473	GEM-1615	6TM-S 47
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C29	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C32	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C33	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C34	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C35	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C36	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C37	2200 10%		DI-2200		PM6D22	CCD-222	GP220	10TS-D22
C38	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C39	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C40	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C41	220 10%		NPO-SI 220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C42	.0022 200V 10%		V84C4D22-10%		PM6D22	6DP-1-222	GP222	6TM-D22
C43	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22

TUNER CHASSIS—TOP VIEW



TUNER PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C44	.0033 200V 10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C45	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C46	.01 200V 10%		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C47	.01 200V 10%		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C48	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C49	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C50	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C51	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C52	220 10%		DI-220	DD-221	L10T22	CCD-220	GP322	10TS-T22
C53	.0022 400V 10%		V84C4D22-10%		PM6D22	6DP-1-222	GP222	6TM-D22
C54	2200 10%		DI-2200		PM6D22	CCD-220	GP222	10TS-D22
C55	.0033 200V 10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C56	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C57	.01 200V 10%		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C58	.01 200V 10%		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C59	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C60	1000		EF-001	MFT-1000		CCF-102	CT28QA	
C61	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	2.2meg	
R6	220Ω	
R7	220Ω	
R8	2200Ω	
R9	10K	
R10	220Ω	
R11	1000Ω	
R12	4.7meg	
R13	4.7meg	
R14	220Ω	
R15	47Ω	
R16	100K	
R17	1800Ω	
R18	2.2meg	
R19	220Ω	
R20	100K	
R21	220Ω	
R22	100Ω	
R23	220K	
R24	47K	

ITEM No.	RATING	REMARKS
R25	15K	
R26	150K	
R27	100K	
R28	150K	
R29	2.2meg	
R30	2.7meg	
R31	1.5meg	
R32	1.5meg	
R33	1.5meg	
R34	220K	
R35	680K	
R36	33K	
R37	150K	
R38	560K	
R39	82K	
R40	33K	
R41	150K	
R42	82K	
R43	560K	
R44	100K	

ITEM No.	RATING	REMARKS
R45	100K	
R46	680Ω	
R47	560K	
R48	2.2meg	
R49	82K	
R50	33K	
R51	47K	
R52	22K	
R53	2200Ω	
R54	680Ω	
R55	2.2meg	
R56	560K	
R57	82K	
R58	47K	
R59	22K	
R60	2200Ω	
R61	33K	
R62	10K 1W	
R63	2000Ω 10W	
R64	680Ω	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *	1/2	63-4383				■ UE3958	Loudness, Left Channel
B	2meg *	1/2						Stereo Balance, Right Channel
R2A	1meg	1/2	63-4460					Bass, Left Channel
B	1meg	1/2						Bass, Right Channel
C	Switch							
R3A	10K	1	63-4411	B-13		Q11-116	▲ UE3914	Presence, Left Channel
B	10K	1		SR-13		M11-116		Presence, Right Channel
R4A	1meg	1/2	63-4476	AB-70	AD47-1meg-Z	Q13-137		Treble, Left Channel
B	1meg	1/2		SR-70	Not Req.	M13-137		Treble, Right Channel
C	Shaft			AK-7	FS-3	Not Req.		

* Taps at 500K and 1 meg.
■ "STA-LOC" equivalent: FC26DT16, RU26DT125, OS1750, IK2312.
▲ "STA-LOC" equivalent: FA14L, RU14L, CS3500.
▲ "STA-LOC" equivalent: FA16A, RU16A. CS3500.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	20-337	19-1003	19-1003	BC-537	4608		
L2	FM Ant. Coil	20-682	19-1000	19-1000	BC-561	4602		
L3	FM RF Coil	S-15743						
L4	FM Osc. Coil	S-15691						
L5	Loop Ant.	S-44649						
L6	AM Osc. Coil	S-42847 †						
L7	1st FM IF	95-1150	16-3487 ▲	16-3487 ▲	FM-251 ▲	1451 ▲		
L8	1st AM IF	95-1250						
L9A	2nd FM If	95-1251						
B	2nd AM IF							
L10	3rd FM IF	95-1150	16-3487 ▲	16-3487 ▲	FM-251 ▲	1451 ▲		
L11	3rd AM IF	95-1102	16-6770 ▲	16-6770 ▲	BC-355 ▲	12-C6 ▲		
L12	Discriminator	95-1153						
L13	Fil. Choke	20-337	19-1003	19-1003	BC-537	4608		4.2uh

† Alternate Part #S-46288.

▲ Remove Center Bolt & Mtg. Plate & Use Adapter Plate.
▲ Enlarge Mtg. Hole.

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Limiter Grid Filter	25mmf, 100K	105-42	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	142-92 (Includes M2)	13TB	Not Req.	26S	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78 RPM)	W-101STS † or W-102S †	E98 † or E98D ♦	† Jewel ♦ Diamond
	(LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

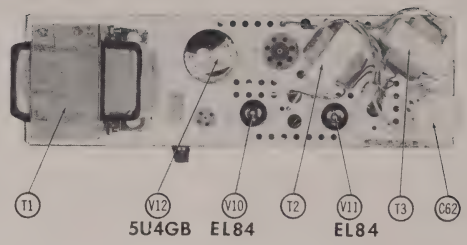
MISCELLANEOUS

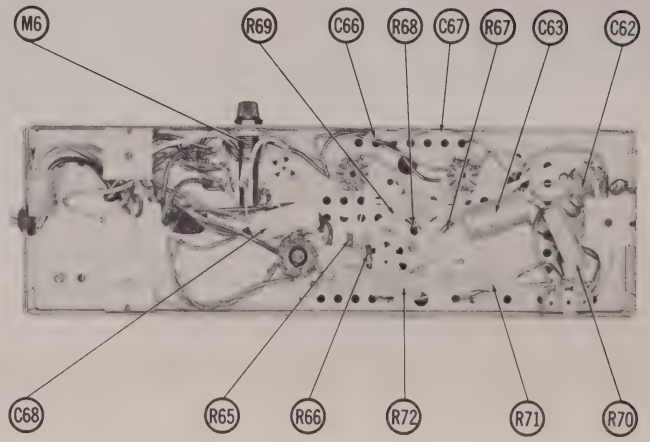
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap	22-3019	2 Gang (Ant. 20—457mmf, Osc. 30—195mmf)
M4	Switch	85-614	Band Switch
M5	Switch	85-611	Record Compensating

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

AMP CHASSIS





AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V10	Left Channel Output	EL84/6BQ5
V11	Right Channel Output	EL84/6BQ5

ITEM No.	USE	TYPE
V12	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C62A	▲80	450	22-3159	AFH3-46	CO370	FP378	TMT-43	TVL-3793	
B	■40	450							
C	▲30	450							
C63	100	50	22-3160	PRS1360	BR1005	TC3501	TD-100-50	TVA-1310	
C64	3	30NP	22-2945	NP-PRS7405	BBR8-50 †	TCN503		TVAS-1215 *	
C65	3	30NP	22-2945	NP-PRS7405	BBR8-50 †	TCN503		TVAS-1215 *	

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C66	47 N75 10%	#22-2376						
C67	47 N75 10%	#22-2376						
C68	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R65	1000Ω	
R66	1meg	
R67	1000Ω	

ITEM No.	RATING	REMARKS
R68	1meg	
R69	165Ω 2W	
R70	1000Ω 10W	

ITEM No.	RATING	REMARKS
R71	1200Ω 7W	
R72	2200Ω 10W	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ 1A	650 VCT Ⓐ .110A	5V Ⓐ 3A	95-1633						
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT Ⓐ 2.5A	6.3V Ⓐ 1.8A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	8200Ω Tap Ⓐ 3%	110Ω SEC. 2 6-8Ω	95-1660							
T3	8200Ω Tap Ⓐ 3%	SEC. 1 110Ω SEC. 2 6-8Ω	95-1660							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	①49-852	12A6PA	① Channel 1
SP2	5"	PM	3-4Ω	①49-856	5A1Z3, 4	② Channel 2
SP3	12"	PM	6-8Ω	②49-852	12A6PA	
SP4	5"	PM	3-4Ω	②49-856	5A1Z3, 4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M6	3AG	4A 250V	136-31	62-17	312004 (3AG 4A 250V)	342001	MTH 4	HKP

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	S-44166	Tuning
Knob	46-2097	Volume
Knob	46-1997	Volume (Remote)
Knob	S-46162	Presence, Bass, On-Off, Treble
Knob	46-2080	Radio-Phono, -Record Compensating
Dial Pointer	59-341	
Dial Scale	26-613	
Dial Crystal	192-254	
Cabinet	14-2641E	Model SF2530E
Cabinet	14-2641R	Model SF2530R
Cabinet	14-2641W	Model SF2530W
Cabinet Leg	96-215	Model SF2530R
Cabinet Leg	96-216	Model SF2530E
Cabinet Leg	96-217	Model SF2530W

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

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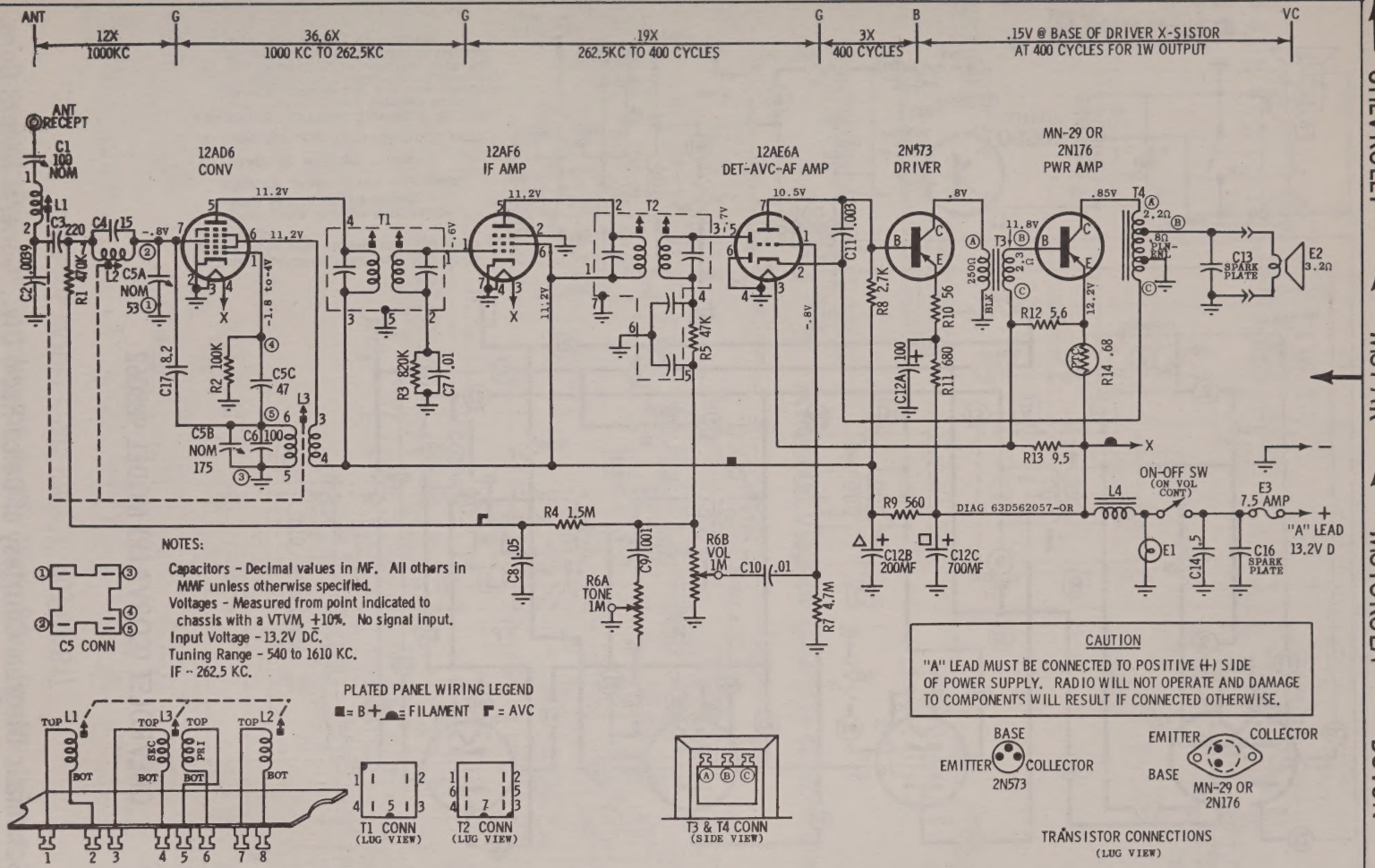
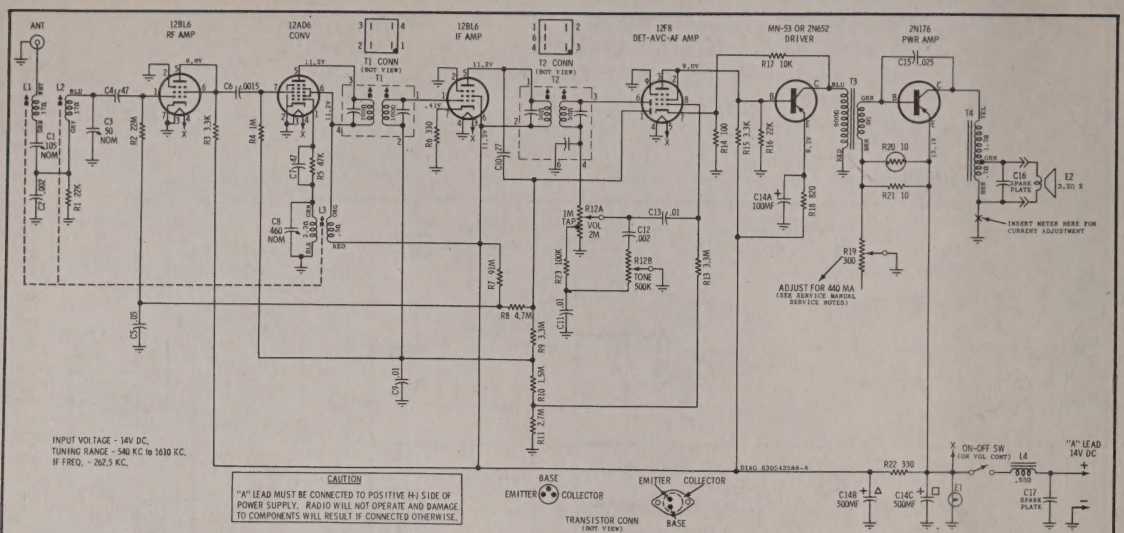

ANT
12X
1000KC
G
36.6X
1000 KC TO 262.5KC
G
19X
262.5KC TO 400 CYCLES
G
3X
400 CYCLES
B
.15V @ BASE OF DRIVER X-SISTOR
AT 400 CYCLES FOR 1W OUTPUT
VC
ANT RECEPT
12AD6 CONV
12AF6 IF AMP
12AE6A DET-AVC-AF AMP
2N573 DRIVER
MN-29 OR 2N176 PWR AMP
NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.
Voltages - Measured from point indicated to chassis with a VTVM, ±10%. No signal input.
Input Voltage - 13.2V DC.
Tuning Range - 540 to 1610 KC.
IF - 262.5 KC.
C5 CONN
PLATED PANEL WIRING LEGEND
■ = B+ ▬ = FILAMENT ▛ = AVC
T1 CONN (LUG VIEW)
T2 CONN (LUG VIEW)
T3 & T4 CONN (SIDE VIEW)
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
2N573
MN-29 OR 2N176
TRANSISTOR CONNECTIONS (LUG VIEW)

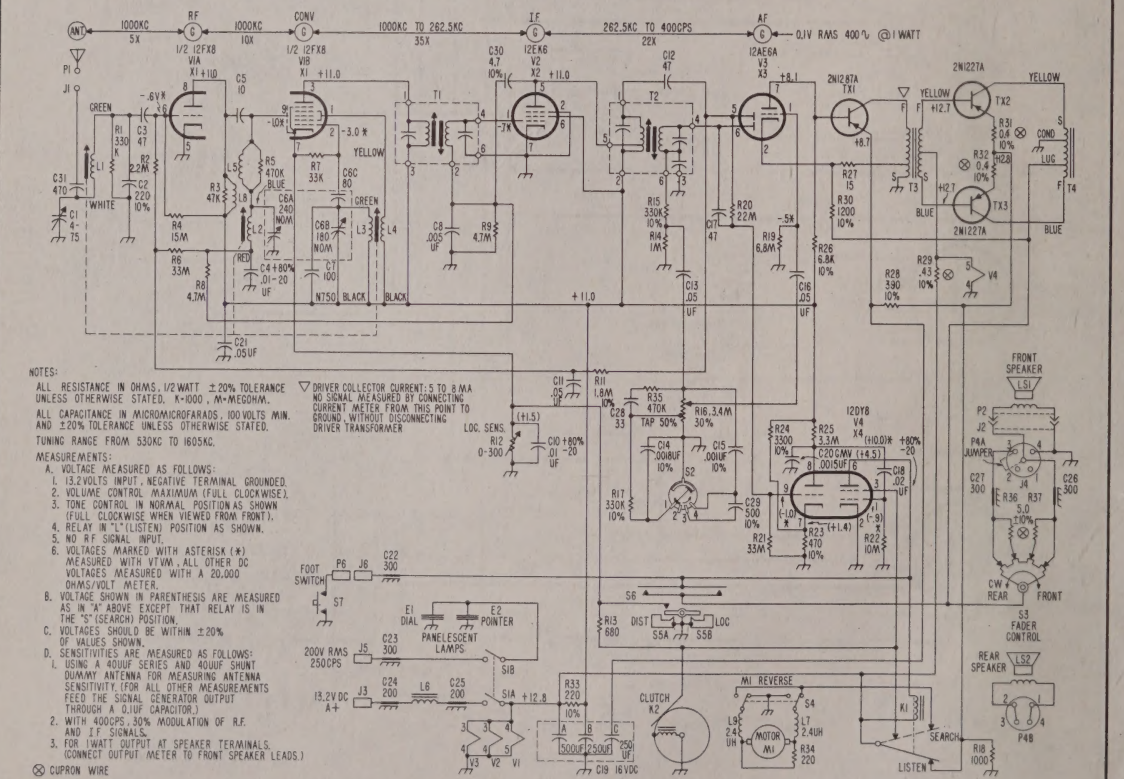
MOPAR MODEL 102

Schematic Diagram Courtesy of Motorola Inc.


ANT
12BL6 RF AMP
12AD6 CONV
12BL6 IF AMP
12F8 DET-AVC-AF AMP
MN-53 OR 2N652 DRIVER
2N176 PWR AMP
T1 CONN (BOT VIEW)
T2 CONN (BOT VIEW)
INSERT METER HERE FOR CURRENT ADJUSTMENT
ADJUST FOR 440 MA (SEE SERVICE MANUAL SERVICE NOTES)
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.
TRANSISTOR CONN (BOT VIEW)
ON-OFF SW (ON VOL CONT)
"A" LEAD 14V DC

MOTOROLA MODEL 10MX

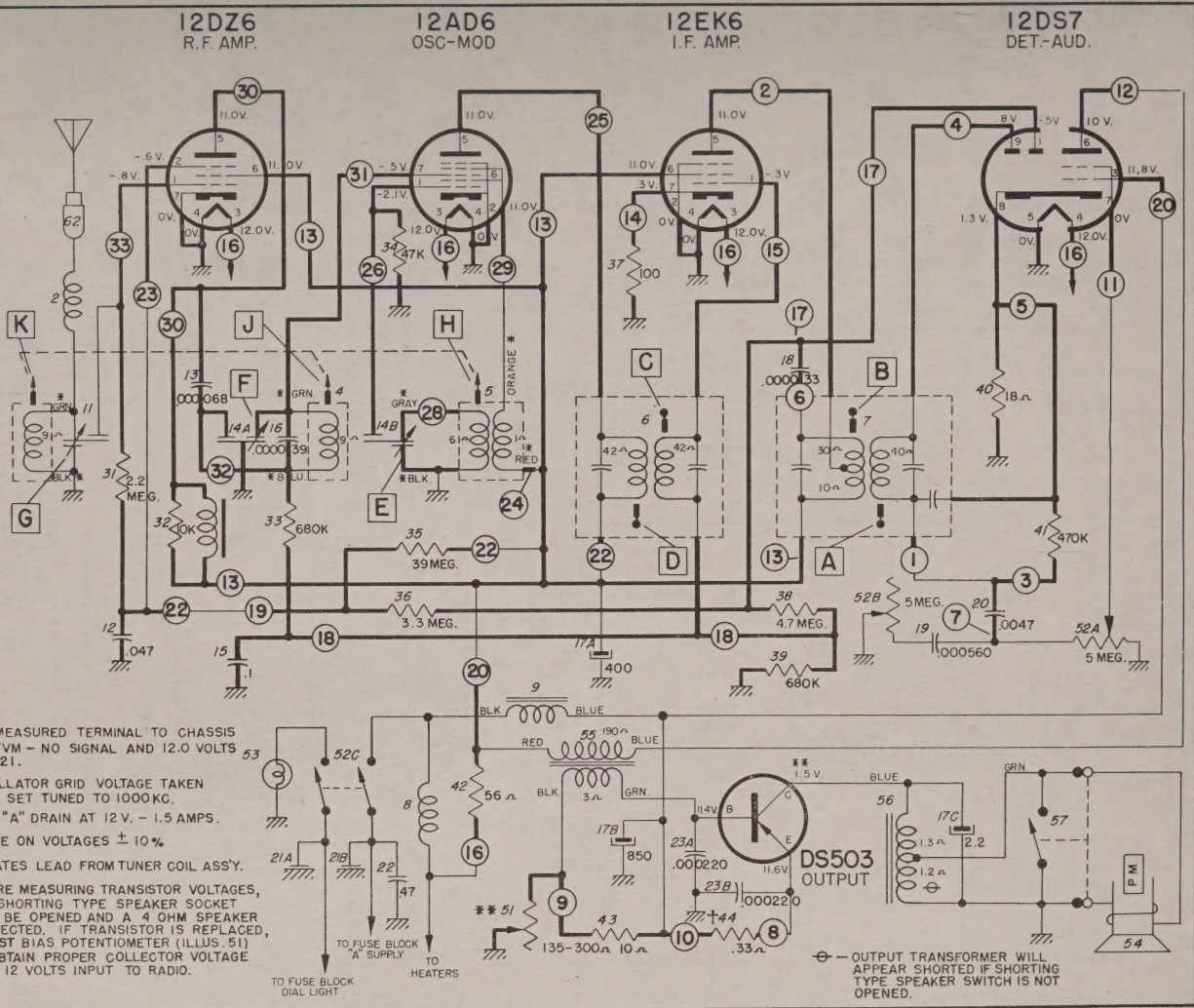
Schematic Diagram Courtesy of Motorola Inc.


1000KC 5X
1000KC 10X
1000KC TO 262.5KC 35X
262.5KC TO 400CPS 22X
0.1V RMS 400Ω @ 1 WATT
1/2 12FX8 V1A
1/2 12FX8 V1B
12E6 V2
12AE6A V3
2N128A TX1
2N1227A TX2
2N1227A TX3
T1
T2
T3
T4
V4
NOTES:
ALL RESISTANCE IN OHMS, 1/2 WATT ±20% TOLERANCE UNLESS OTHERWISE STATED. K=1000, M=MEGOHM.
ALL CAPACITANCE IN MICROMICROFARADS, 100 VOLTS MIN. AND ±20% TOLERANCE UNLESS OTHERWISE STATED.
TUNING RANGE FROM 530KC TO 1605KC.
MEASUREMENTS:
A. VOLTAGE MEASURED AS FOLLOWS:
1. 13.2 VOLTS INPUT, NEGATIVE TERMINAL GROUNDED.
2. VOLUME CONTROL MAXIMUM (FULL CLOCKWISE).
3. TONE CONTROL IN NORMAL POSITION AS SHOWN (FULL CLOCKWISE WHEN VIEWED FROM FRONT).
4. RELAY IN "L" (LISTEN) POSITION AS SHOWN.
5. NO R.F. SIGNAL INPUT.
6. VOLTAGES MARKED WITH ASTERISK (*) MEASURED WITH VTVM, ALL OTHER DC VOLTAGES MEASURED WITH A 20,000 OHMS/VOLT METER.
B. VOLTAGE SHOWN IN PARENTHESIS ARE MEASURED AS IN "A" ABOVE EXCEPT THAT RELAY IS IN THE "S" (SEARCH) POSITION.
C. VOLTAGES SHOULD BE WITHIN ±20% OF VALUES SHOWN.
D. SENSITIVITIES ARE MEASURED AS FOLLOWS:
1. USING A 400UF SERIES AND 400UF SHUNT DUMMY ANTENNA FOR MEASURING ANTENNA SENSITIVITY. (FOR ALL OTHER MEASUREMENTS FEED THE SIGNAL GENERATOR OUTPUT THROUGH A 0.1UF CAPACITOR.)
2. WITH 400CPS, 30% MODULATION OF R.F. AND I.F. SIGNALS.
3. FOR 1 WATT OUTPUT AT SPEAKER TERMINALS, CONNECT OUTPUT METER TO FRONT SPEAKER LEADS.)
⊗ CUPRON WIRE
▽ DRIVER COLLECTOR CURRENT: 5 TO 8 MA NO SIGNAL MEASURED BY CONNECTING CURRENT METER FROM THIS POINT TO GROUND, WITHOUT DISCONNECTING DRIVER TRANSFORMER
FOOT SWITCH
DIAL
POINTER
PANELESCENT LAMPS
200V RMS 250CPS
13.2V DC A+
CLUTCH
MOTOR
REVERSE
SEARCH
LISTEN
FRONT SPEAKER
REAR SPEAKER
FADER CONTROL
CW REAR
FRONT

MOPAR MODELS 402 (04BC), 403 (04BI)

Schematic Diagram Courtesy of Bendix Radio Div., Bendix Aviation Corp.

CHEVROLET (CORVAIR) MODEL 988062



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 21.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

TOTAL "A" DRAIN AT 12 V. – 1.5 AMPS.

TOLERANCE ON VOLTAGES ± 10%

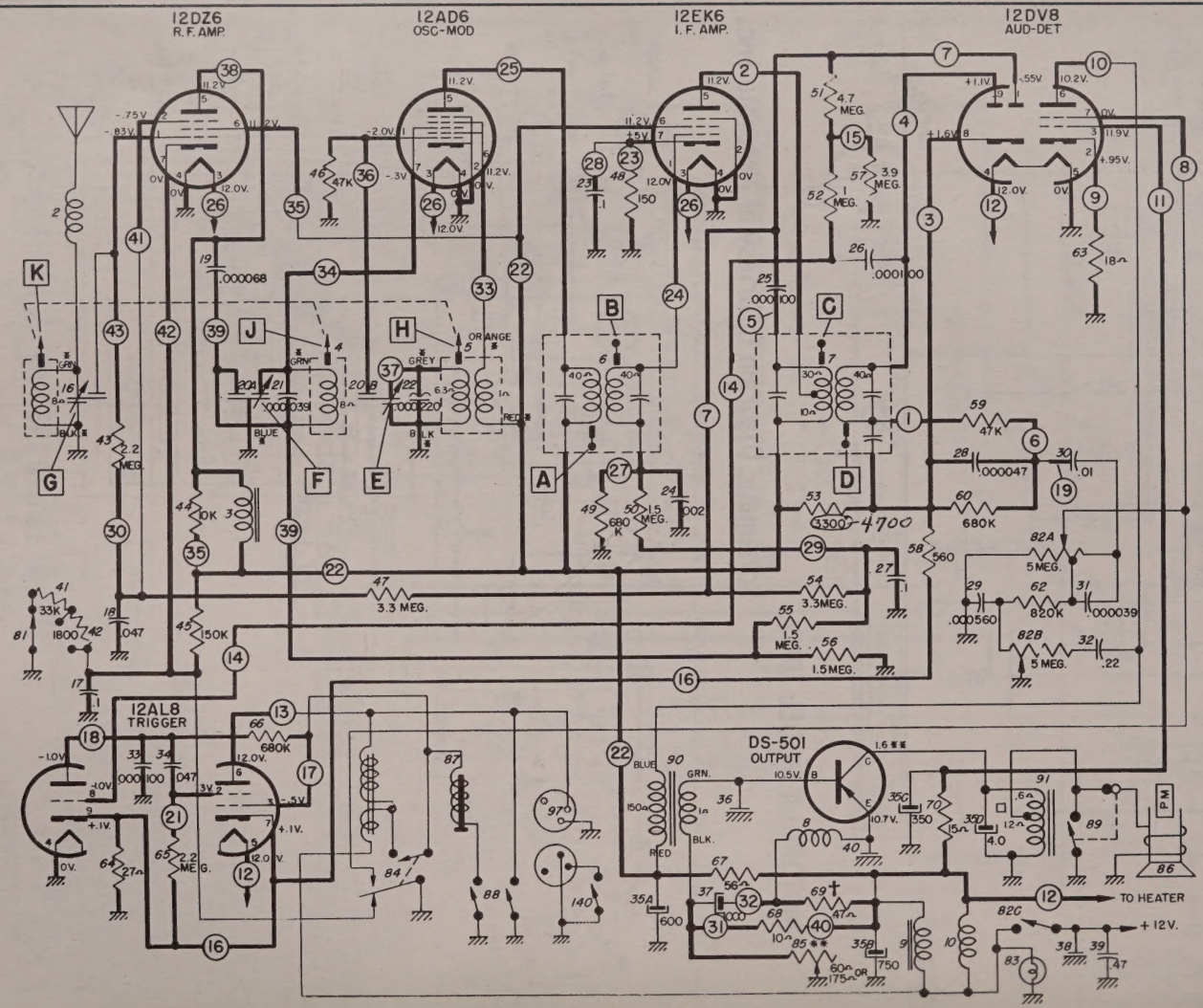
* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 51) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

⊖ – OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT OPENED.

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.

BUICK MODEL 980052



IF RADIO IS POWERED BY BATTERY ELIMINATOR, USE 16 VOLTS FOR PROPER SOLENOID ACTION.

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.